



ECHO - PCX

Private Communication Exchange Installation & Operation manual

VERSION 1.0



FEDERAL SIGNAL CORPORATION
Communications Systems Division

SAFETY NOTICES

People's lives depend on your safe installation, service, and operation of our products. Follow Federal, State, and local codes for installation and operation of this equipment. It is important to read, understand and follow all instructions shipped with this product. In addition, listed below are some other important safety instructions and precautions you should follow:

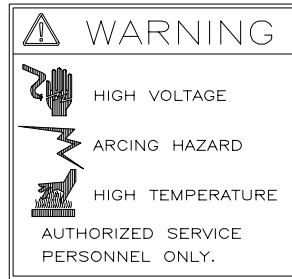
INSTALLATION & SERVICE

- Electrocution or severe personal injury can occur when performing various installation and service functions such as making electrical connections, drilling holes, or lifting equipment. Therefore installation should be performed by experienced technicians in accordance with national, state and any other electrical codes having jurisdiction.
- If suitable equipment is not selected, the installation site for the loudspeaker is not selected properly or the system is not installed properly, it may not produce the intended optimum audible warning. Follow guidelines provide in this manual and, state and local regulations/codes.
- The sound output of loudspeakers is capable of causing permanent hearing damage. To prevent excessive exposure, carefully plan siren placement, post warnings and restrict access to areas near the sirens. Whenever possible, disconnect the siren batteries before working near the speaker array.
- After installation or service, test the system to confirm that it is operating properly. Test the system regularly to confirm that it will be operational in an emergency.
- If future service personnel do not have these warnings and all other instructions shipped with the equipment to refer to, the siren system may not provide the intended audible warning and service personnel may be exposed to death, permanent hearing loss, or other bodily injury. File these instructions in a safe place and refer to them periodically. Give a copy of these instructions to new recruits and trainees. Also, give a copy to anyone who is going to service or repair the system. For additional copies, call Federal Signal Federal Warning Systems Group at 800-524-3021 or write to them at 2645 Federal Signal Drive, University Park, IL. 60466.

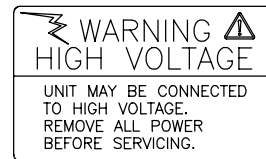
OPERATION

- Failure to understand the capabilities and limitations of your ECHO system could result in permanent hearing loss, other serious injuries or death. Carefully read and thoroughly understand all safety notices in this manual and all operations related items in all instruction manuals shipped with the equipment. Thoroughly discuss all contingency plans with those responsible for utilizing and operating the system within your facility.

Safety Notices Externally Placed



Safety Notices Internally Placed



TYPICAL WARNING LABELS

LIMITED WARRANTY

, Federal Signal Corporation (Federal), warrants each new product to be free from defects in material and workmanship, under normal use and service, for a period of two years on parts replacement and one year on labor from the date of delivery to the first user-purchaser.

During this warranty period, the obligation of Federal is limited to repairing or replacing, as Federal may elect, any part or parts of such product which after examination by Federal discloses to be defective in material and/or workmanship.

Federal will provide warranty for any unit which is delivered, transported prepaid, to the Federal factory or designated authorized warranty service center for examination and such examination reveals a defect in material and/or workmanship.

*This warranty does not cover travel expenses, the cost of specialized equipment for gaining access to the product, or labor charges for removal and re-installation of the product.
Batteries are not covered under warranty.*

This warranty does not extend to any unit which has been subjected to abuse, misuse, improper installation or which has been inadequately maintained, nor to units which have problems relating to service or modification at any facility other than the Federal factory or authorized warranty service centers.

THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL FEDERAL BE LIABLE FOR ANY LOSS OF PROFITS OR ANY INDIRECT OR CONSEQUENTIAL DAMAGES ARISING OUT OF ANY SUCH DEFECT IN MATERIAL OR WORKMANSHIP.



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Part 1. General Description

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1.0 GENERAL DESCRIPTION

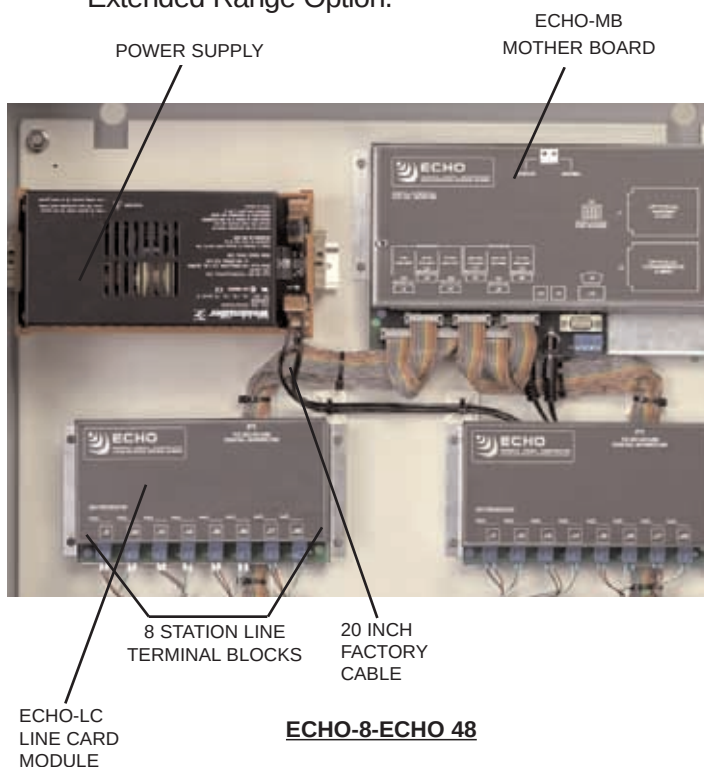
1.1 CENTRAL EXCHANGE

1.1.1 Central Exchange

Model ECHO-MB Mother Board is self-contained in a surface mount metal enclosure and has provision for connecting up to six plug-in Model ECHO-LC/ECHO-LC-X Line Card Modules and two Power Supply units.

Each Model ECHO-LC Line Card Module is self-contained in a surface mount metal enclosure and has a capacity of 8 station lines. It is equipped with 20 inch flat ribbon cable that attaches to the ECHO-MB.

Model ECHO-LC-X Line Card Module provides Extended Range of 2.4 mi. (4km) when used with call stations equipped with the -EXT Extended Range Option.



ECHO-8-ECHO 48

ECHO-MB/ECHO-LC/ECHO-LC-X

Central Exchange

1.1.2 Central Exchange Technology

The fully digital, microprocessor controlled Central Exchange employs switched PCM encoded voice and data for interference-free communications. The system is capable of digital duplex, hands-free voice communication at

both calling and called party stations as well as digital control of features. Speech channels throughout the Central Exchange and the transmission lines are completely digital to and from each call station and eliminate adjustment prone analog type circuitry throughout. A single pair, star wiring configuration is used between the Central Exchange and each call station. Serial data ports allow connection of real time interactive displays such as computers and programming tools.

The Central Exchange employs Flash memory technology allowing future program upgrades for system features and functions as developed by the Manufacturer to be made remotely via a PC without the need for component replacement of memory modules.

1.1.3 Central Exchange Capacities

A single ECHO-MB Mother Board may be equipped with up to six line cards for an exchange capacity of 48 stations. Two ECHO-MB Mother Boards may be connected together via ECHO-MC modem cards for a maximum exchange capacity of 96 stations. Alternate control cabinets offer system capacity up to 9072 stations.

1.1.4 Central Exchange Links

The ECHO-MB provides 100% non-blocking call connection for up to 48 stations. When two Mother Boards are connected together, up to 30 simultaneous calls may be placed between Mother Boards. If the originating and destination stations attempting simultaneous calls are connected to the same Mother Board, the calls will be non-blocking for all 48 stations. If the originating and destination stations attempting simultaneous calls are connected to different Mother Boards, up to 30 simultaneous calls may be placed. A two Mother Board exchange would be completely non-blocking if each Mother Board were equipped with a maximum of 30 stations each, thus reducing the maximum exchange capacity from 96 to 60 stations.

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1.2 COMMON AND PORT EQUIPMENT

1.2.1 ECHO-MB Mother Board

Contains a microprocessor, memory with system operating instructions and the digital switch which controls data traffic paths between stations. Equipped with Serial Data Port and LED diagnostic indicators.

1.2.2 ECHO-MC Modem/Clock Card

Provides communications and timing control between Mother Boards. Allows two Mother Boards to be networked (tie-lined) using two pairs of metallic cable or fiber modems (IFS Series D1200 or Equal). Additional interfaces are not required. Additional dialing digits are not required for calls between networked exchanges.

1.2.3 ECHO-LC Line Card Module

Supports eight, two wire station lines with access to all available system links and features. Station range is 1.2Mi. (2Km.).

1.2.4 ECHO-LC-X Line Card Module

Same as ECHO-LC except station range is extended to 2.4Mi. (4Km.) Used with stations equipped with EXT option.

1.2.5 ECHO-CC Conference Card

Permits up to 10 simultaneous conferences with up to five members with a maximum of 30 stations.

1.2.6 ECHO-PS Power Supply Module

This self contained module provides a highly regulated source of 24V dc for powering the Central Exchange and stations. Input voltage: 110-240 VAC @ 50-60 Hz. UL, CSA, TUV.

1.2.7 ECHO-RTC Real Time Clock

Provides a Real Time Clock for data and time stamping of call activity data transmitted on the ECHO-MB RS-232 port.

1.2.8 ECHO-SFW Administration Program Software

Allows system programming via the ECHO-MB RS-232 port using a Windows based PC.

1.3 MASTER STATIONS

1.3.1 E-IST Master Call Stations

Equipped with the following controls, display and transducers: 16 button keypad includes keys for digital volume, directory scroll, 10 numeric functions, cancel and connect. The keypad provides tactile and audible feedback for positive activation. The LCD display has two lines of 16 characters each of full alpha-numeric English phrases for display of station status. The speaker size is 2.5in., 45 Ohm, 3 Watt moisture resistant with 92 dB sensitivity. The electret microphone has sensitivity of - 70dB with S/N ratio greater than 60dB. Overall frequency response is shaped by the internal Digital Signal Processor to conform to digital telephone standards. Faceplate thickness is .12in. (3mm) anodized aluminum with mylar overlay for flush wall mount or surface mount using E-SMB box. Field wiring terminal is plug-in. Station wiring is two conductors for full feature capability. The station employs Digital Signal Processors for natural speech quality in difficult acoustic conditions.

1.3.2 E-ISM Master with Membrane Keypad

Equipped with the same controls, display and transducers as E-IST except keypad is a flush membrane type with spill proof overlay permitting frequent wipe-down.

1.3.3 E-DST/E-DSM/E-DSMG Handset Master Call Station

Equipped with the following controls, display and transducers: Integral handset with coiled cord for private conversations. Enclosure and handset is an ash tone thermoplastic suitable for desk or surface wall mount. Panel speaker is 2.5 in., 45 Ohm and microphone is electret. The keypad is equipped with 16 buttons and provides tactile and audible feedback for positive activation. LCD display shall be 2 line, 16 character/line. The station displays alpha-numeric station status in plain English. Field wiring terminal is plug-in. Station wiring is two conductors for full feature capability. Station employs Digital Signal Processors for natural speech quality in difficult acoustic conditions.

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Handset Master station with flush membrane keypad is E-DSM. Handset Master with gooseneck microphone replacing panel microphone is E-DSMG. The keypad section is constructed to prevent liquid spills from damaging internal components.

1.3.4 E-MIST/E-MISM Flush Wall Handset Master Station

Equipped with the same controls, display and transducers as E-DST with an anodized aluminum faceplate permitting flush wall mount of the station in backbox E-BB1. Flush Wall Handset with membrane keypad is E-MISM.

1.4 SUB-STATIONS

1.4.1 E-DD1 / E-DD2 / E-SSSB3 / E-SSSB4 Single, Dual Call, 3 Call, or 4 Call

Equipped with a call-placed LED, one Call (E-DD2 two Call, E-SSSB3 3 Call, E-SSSB4 4 Call) and one Cancel button. Units are equipped with a relay with heavy duty contacts for remote control. Each sub-station Call button is capable of calling a specific pre-programmed station. Faceplate is .12in. (3mm) anodized aluminum with mylar overlay for flush wall mount or surface mount using E-SMB box. Field wiring terminal is plug-in.

1.4.2 E-SSSB1/E-SSSB1KR/E-SSSB2 High Security Single/ Dual Call

Equipped with 11ga., (.125in. 3mm) thick stainless steel faceplate with a brushed finish, a solid metal tamper resistant call switch (E-SSSB2 two Call switch) and tamper proof mounting fasteners. E-SSSB1KR is also equipped with a key reset switch. A mylar moisture-resistant 2.5 in. speaker is shielded against tampering by internal protective plated steel baffles and the microphone is enclosed in a right angle tamper resistant housing. Surface backbox is E-SSMB.

1.4.3 E-SSMB1 High Security with Mushroom Button

Same specifications as E-SSSB1 except equipped with solid metal red mushroom push button.

1.5 ADMINISTRATIVE MASTERS

1.5.1 E-MDS/E-MDSMG ADMINISTRATIVE MASTER

Equipped with the following controls, display and transducers: Integral handset with coiled cord for private conversations. Enclosure and handset is an ash tone thermoplastic suitable for desk or surface wall mount. Flush membrane keypad has 24 buttons; 17 dedicated, 7 programmable. The keypad provides tactile and audible feedback for positive activation. The keypad section is constructed to prevent liquid spills from damaging internal components. LCD display is 2 line, 16 character/line. LED indicators are: Routine, Emergency, More Calls and Call Engineer. There is an audible Alert with Tone Silence and Resound. Field wiring terminal is plug-in. Station wiring is two conductors for full feature capability. Station employs Digital Signal Processors for natural speech quality in difficult acoustic conditions.

Master with gooseneck microphone replacing panel microphone is E-MDSMG.

1.6 SPECIAL STATIONS AND INTERFACES

1.6.1 SPEAKER

Connects to any call station and broadcasts voice and ringing signal over external speakers. Units require external power source. Use with T-300CK Connector Kit.

1.6.2 ECHO-BGM AUDIO PROGRAM DISTRIBUTION STATION

Connects to a station line on the exchange. Used to interface the exchange with an audio program source through a built-in isolation transformer. Field wiring terminals are plug-in.

1.6.3 ECHO-PAI PUBLIC PAGE STATION

Connects to a station line on the exchange. Used to interface the exchange with a P.A. page amplifier through a built-in isolation transformer. Provides relay contacts for muting the background music channel on the amplifier. Field wiring terminals are plug-in.

1.6.4 ECHO-PSRADIO POCKET PAGE STATION

Connects to a station line on the exchange. Used to interface the exchange with a radio

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page encoder and base station via an RS-232 serial data port. The interface supports TAP and COMP 2 protocols.

1.6.5 ECHO-2WRI TWO-WAY RADIO STATION

Connects to a station line on the exchange. Used to interface the exchange with a two-way radio base station through a built-in isolation transformer and provides control circuitry for relay contacts to function as PTT control.

1.6.6 ECHO-PBXI Telephone Interface

Connects to a station line on the exchange. Used to interface the exchange with a PBX analog port or CO line. Multiple ECHO-PBXI Interfaces may be connected to the Central Exchange.

1.6.7 ECHO-FOTI Fiber Optic Station Interface

Used to interface any ECHO - PCX station to fiber optic transceivers for connection to the Central Exchange.

1.6.8 ECHO-IOLU Relay Interface

Used to provide relay contact closure corresponding to call activity on stations in the ECHO - PCX system.

1.6.9 EXT Option

Stations equipped with the EXT option and connected to a ECHO-LC line card have an extended range of 2.4 miles (4 km).

1.6.10 Power Supply

Plug in power cube for use with ECHO-FOTI and EXT option.

1.7 BACK BOXES

1.7.1 E-BB1 Flush Mount Back Box

22 ga. galvanized steel. For use with E-MIST, E-MISM

1.7.2 E-BB2 Flush Mount Back Box

22ga. galvanized steel. For use with ECHO-PAI, E-DD1, E-DD2, E-IST, E-ISM, ECHO-BGM, E-SSSB3, E-SSSB4, ECHO-PBXI, and ECHO-2WRI

1.7.3 E-SMB Surface Mount Back Box

.080 anodized aluminum. For use with ECHO-PAI, E-DD1, E-DD2, E-IST, E-ISM, ECHO-BGM, E-SSSB3, E-SSSB4, ECHO-PBXI, and ECHO-2WRI

1.7.4 E-SSMB Surface Mount Back Box, High Security

.060 steel with white mar-resistant baked epoxy finish. For use with Cat. ECHO-SSMB1, E-SSSB1, E-SSSB1KR, E-SSSB2

1.8 OPERATIONAL FEATURES

1.8.1 Master Stations

Master Stations have a complete 16 key dialing keypad and a 2-line by 16 character LCD display.

1.8.1.1 Placing a Call

Master Stations are capable of calling any other station in the system by touch dialing an extension number. When the calling party enters the extension, the digits and called party directory name display on the integral LCD display of the station. At the called party station, the number and directory name of the calling party shall display. After connecting, handsfree communication may begin and both parties may converse naturally without pressing any buttons. Calls may be canceled by either party by pressing the "X" button or going on-hook. Incompletely dialed calls will time-out in five seconds.

1.8.1.2 Privacy

Stations may be preset to any of four modes of privacy for receiving calls. Stations in Non-private (Automatic Loudspeaking Answer) and Semi-private (Manual Answer) mode both receive a pre-announce tone and automatically connect when called; a Manual Answer station microphone is muted until answered by keying "T" or going off-hook. Stations in Full Privacy (Ring) mode receive a ring tone and are answered by pressing "T" or going off-hook. Stations in Do-Not-Disturb mode appear busy to calling party.

1.8.1.3 Volume Control

The volume for both voice and ring signal are independently adjusted by means of digital volume keys on the station keypad. The keypad volume keys control the volume for hand-

set and handsfree operation.

1.8.1.4 Remote Control

It is possible to remotely control relays on sub-stations where ancillary devices such as door releases, bells, lights or CCTV cameras may be activated by connecting to the station and dialing a single digit.

1.8.1.5 Handset Operation

A handset with coil cord is provided for private conversations on handset stations. When the handset is lifted off-hook the panel speaker and microphone are disconnected and handset is enabled. Calls between handset stations are full duplex. It is possible to use the keypad with the handset on or off-hook.

1.8.1.6 LCD Display

Each master station has the capability to provide plain English phrase LCD display of feature-in-progress including: RINGING, BUSY, HOLD, TRANSFER, CONFERENCE, ALL-CALL, GROUP CALL, PAGE REPLY PROMPT, MESSAGE WAITING, CAMP-ON BUSY, CALLED and CALLING PARTY NAME ID, HELP MENU, NAME/NUMBER DIRECTORY, CALL FORWARD.

1.8.1.7 Name Directory

Each master station has the capability to display a unique directory of up to 20 frequently called extension numbers and names using a single key to scroll and a single key to dial displayed extension.

1.8.1.8 Invalid Extension Detection

Calls to extensions which are not configured will display the called extension number for 4 seconds before returning to idle.

1.8.1.9 Limits, Time-Out

Time-out limits can be set for automatic cancellation of functions such as All-call page.

1.8.1.10 Failed Station Detection

Calls to a station with failed wiring or equipment will display as "FAILED" on a Master LCD.

1.8.1.11 Busy Indication

LCD screen displays "BUSY" when a called station or link is in use. Also displayed when called station is in Do Not Disturb.

1.8.1.12 Preannounce Tone

Stations receive a short alert tone upon connection of call. Global on/off programming.

1.8.1.13 Hands-free, Two-Way Loudspeaking

Calls may be established in the two-way handsfree loudspeaking mode.

1.8.1.14 Private Conversation

Stations equipped with handsets may converse in full duplex, for privacy or in high noise areas.

1.8.1.15 Programming

The system configuration for all stations may be programmed from a Master station or a PC with the ECHO-SFW Administration Program Software without interruption to other calls in progress or control functions.

1.8.1.16 Restricted Access

Access to certain system functions such as Priority Break-in, All-call Paging and others can be limited to specific stations.

1.8.1.17 Partitions

The Exchange has 99 partitions. Stations in the same partition can communicate with each other. Communication between stations in different partitions is blocked. A station may be programmed to belong to any one of 99 partitions or partition 0. A station in partition 0 may communicate with any partition. Partition 0 is usually reserved for an attendant position.

1.8.2 Sub-Stations

Each sub-station call button places a call to a preprogrammed destination. It is possible to program any number of sub-stations to call the same master station.

Multi-button Sub-Stations can place calls to several pre-programmed destinations. Call destination and volume is set in program mode. Sub-stations have the capability to be programmed to place two types of calls, Standard and Admin.

1.8.2.1 Standard Calls

Sub-station buttons programmed as Standard place calls to masters or substations and are processed in the same manner as a call from a master station.

1.8.2.2 Admin Calls

Sub-station buttons programmed as Admin place calls to Administrative Masters where they are stacked allowing multiple sub-stations to place simultaneous calls to the same master without receiving busy or being lost. Sub-station buttons set as Admin are capable of being programmed to place either Routine or Emergency level calls with selectable Locking or Non-locking status. Admin calls are capable of being assigned any of ten programmed text messages and are capable of reporting to multiple masters.

1.8.3 Administrative Master

E-MDS Administrative Masters place and receive calls and have all the same features as a conventional master. Up to eight Administrative Masters can be connected to a ECHO-MB. If Night Mode is disabled, additional Admin Masters may be added in parallel ownership to any or all of the eight.

1.8.3.1 Programmable Keys

In addition to the basic master keypad, the Administrative Master station has eight additional keys, seven of which are capable of being programmed to provide one-touch selection of standard functions. The eighth key is dedicated to Tone Silence.

1.8.3.2 Admin Call

Administrative Masters have the capability to store multiple simultaneous Admin type sub-station calls. It is possible to display and answer Admin type calls without using the numeric touchpad or without losing calls. It is possible to display up to ten levels of substation call priority. LCD display provides an active call count display of up to ten stored calls. If more calls are waiting to be answered, the More Calls LED will illuminate. Multiple masters are capable of receiving Admin calls from the same sub-station. Masters are capable of operating in a parallel or inde-

pendent mode or receive Admin calls from all substations.

1.8.3.3 LED Indicators

LED indicators are provided to indicate status of Admin type calls. LEDs are provided for Routine, Emergency, More Calls and Diagnostic.

1.8.4 Special Interface Stations

These stations provide a means to connect third party equipment to the Central Exchange.

1.8.4.1 Program Distribution

ECHO-BGM Program Distribution Interface station is accessed from a master station by dialing a code corresponding to the interface. It is possible to access multiple Program Interface Stations from any master station. Calling to a station connected to a program source causes the program source at that station to be put on Hold and restored at the end of the conversation.

1.8.4.2 Overhead Page

ECHO-PAI Overhead Page Interface station is accessed from a Master station by dialing an access code corresponding to the interface. It is possible to access multiple Page Interfaces from a Master station. It is possible to set a time limit for Overhead pages.

1.8.4.3 ECHO-PPI Radio Pocket Page

Radio Pocket Page Interface station can be accessed from a master station by dialing an access code. It is possible to transmit, in either the manual or automatic modes of operation, the calling station extension and directory name to be displayed on an alpha-numeric display pager or groups of pagers.

1.8.4.4 Two-Way Radio

ECHO-2WRI two-way Radio Interface Station is accessed from a master station by dialing an access code and allows manual two-way conversation using a single keypad button.

1.8.4.5 PBX Telephone Interface

ECHO-PBXI PBX Telephone Interface can be accessed from a master station by dialing an access code for outgoing calls. Sub-stations

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may auto-dial outside lines. The exchange seizes the first available line in a preassigned hunt group when using multiple ECHO-PBXI Interfaces. Incoming calls may be directed to a specific extension or allowed to dial any extension.

1.8.5 Fiber Optic Station Interface

Fiber Optic Station Interface ECHO-FOTI permits any Master Station or Sub-station operating with a local power module to be linked with the Central Exchange over one or two fiber optic lines using fiber optic transceivers: Not required for linking Central Exchange to Central Exchange.

1.8.5.1 Relay Interface

Each relay contact corresponds to a single station extension. Groups of sixteen station extensions are handled by each ECHO-IOLU Interface. The relay contacts in an Interface unit may be programmed to close when:

- a. A call is placed from a station or
- b. When the call is answered. (audio connected)

The contacts will open when the call is canceled or disconnected.

1.8.6 Adaptable Numbering

The station numbering plan is adaptable. Touch dialing sequences may be two (2) [10-99], three (3) [101-149, 201-249] or four (4) [1001-1149, 1101-1149] digits according to preference or system size. Extension number assignment is under program control and does not require rewiring or setting of switches.

1.8.7 RS-232 Serial Port

Call Placed, Connect, Quit and Busy events are output in ASCII format including Source and Destination extension numbers. An optional real time clock, ECHO-RTC, will provide date/time stamping of each event. A serial printer may be used to produce hard copies. A Video Display Terminal (VDT) may be connected and used to display exchange activity in real time.

1.8.8 Computer Graphical User Interface (GUI)

It is possible to transfer bi-directional serial data between the Central Exchange and a PC computer workstation running the GUI

Application Module. The PC work station functions in a parallel manner to a dedicated Master. It provides Graphical User Interface (GUI) control of icons representing intercom stations on the PC display. A call received at the dedicated Master will change the status of a GUI icon representing the calling station. It is possible to duplicate features and functions of the Master using the Application Module icons on the PC using a touchscreen or mouse.

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tion within a partition. Display reads: "CALLS FORWARDED TO STA ____". Sub-station calls may be forwarded off-premise thru ECHO-PBXI PBX Interface. (refer to section 2.2.3)

2.0 OPERATION

2.1 MASTER STATIONS

2.1.1 All-Call with Reply

KEY "098"

One-way voice paging within a partition to all non-busy stations simultaneously. Program authorization required. Station displays: "ALL CALL". An LCD message prompts the called Master stations to reply to initiating station by keying "T" if so equipped. P.A. Page stations may be included in the page.

2.1.2 All-Call, Emergency

KEY "099"+ PASSWORD

One-way priority break-in paging to all stations in all partitions simultaneously. Busy stations are placed on hold and automatically reconnected. Station displays: "EMER. ALL CALL". Password authorization is optional.

2.1.3 Calling a Station

Key the pre-programmed 2, 3 or 4 digit extension of any active station: 10-99, 101-249 or 1001-1149 within a partition. No leading "0". When a call is placed, the LCD at the calling station displays: CALL TO: xxxx and the Directory name; if the called station is in full privacy the calling station displays RINGING: xxxx. Called station displays: CALL FROM: yyyy, the number and pre-programmed name of the other station. If the called station is in use, calling station displays: *BUSY* xxxx.

2.1.3.1 Call Last Caller/Last Number Redial

KEY "T"

While station is idle, keying "T" calls last extension that called this station or redials last number dialed from this station.

2.1.4 Call Forward

KEY "093"+ "extension"

Ability to automatically redirect or forward incoming Standard calls to a designated sta-

2.1.5 Call Forward-No Answer

KEY "08" [When Connected]

A pre-programmed full privacy station, automatically redirects incoming calls to a designated station when not answered in a preset time period. When setting up, call to designated extension must connect before keying "08". Sub-station calls may be forwarded off-premise thru ECHO-PBXI PBX Interface. (refer to section 2.2.3)

2.1.6 Camp-On Busy

KEY "5" [while displaying busy]

Master stations may camp-on to a busy station. When a called station becomes idle it is automatically connected to first station in camp-on queue. Maximum of 8 different calls in the queue. Calling station momentarily displays: "CAMP-ON". At busy station, LCD displays "*XXX WAITING*" and a periodic audible alert tone sounds.

2.1.7 Conference

KEY "3"

Connect to the first conferee extension. Pressing the Conference digit "3" adds that conferee to the conference stack. Key in the extension of the next conferee and, after connecting, press "3". The process is repeated until up to a total of five conference members including originator is reached. The number of current members is displayed at each conferee station. To join conference, press "T". Conference calls are in the hands-free loudspeaking mode for stations which are on-hook. Ten simultaneous conferences may be held with a maximum of 30 total members. Any conferee may disconnect at any time. When the originator disconnects, all members will be disconnected.

When 10 conferences in progress are exceeded "CONFERENCE LIMIT " is displayed. "MEMBER LIMIT" is displayed when

5 members are exceeded for one conference. "CHANNEL LIMIT" is displayed when 32 links are exceeded for conference.

Requires ECHO-CC Conference Card.

2.1.8 Directory

KEY "D" UP/DN

While idle, keying "D" up/dn arrow allows the user to scroll through a Name/Number Directory of up to 20 previously entered station numbers with assigned names. Keying "T" will speed dial the displayed listing. To add or remove listings: While connected to a station, keying "D" (up arrow) will add a new listing or remove an existing listing. Display shows: "ADDED" or "REMOVED". When directory is full, display shows: "DIRECTORY FULL". To edit your directory: from idle station review list with "D" key. When name to be removed is displayed, press "T" to connect then "D" (up arrow) to remove. "X" to cancel. Called station must be idle.

2.1.9 Disconnect

KEY "X"

Terminate connection and return to idle condition. Also cancels previously selected feature.

2.1.10 Door Control

KEY "4"

Any Master station can activate a remote contact at a connected Sub-station. Display reads: "DOOR CONTROL" while "4" is depressed.

2.1.11 Group Page with Reply

KEY "095"+ 1-9

One-way voice paging to all non-busy members of one of nine pre-programmed groups of stations in a partition. Station displays: "GROUP PAGE 1 2 3 4 5 6 7 8 9". An LCD message prompts the called stations to reply by keying "T". Group assignment for station is made in program mode.

2.1.12 Help Menu

KEY "0" + "D" UP/DN

Display a list of active features with corresponding access keys.

2.1.13 Hold

KEY "1"

When connected to a station, either party can place the call on hold by pressing the "1" key. Both stations will display: "HOLDING" and held party receives Hold tone. The originator of hold can restore by pressing "T". Either party may disconnect while on hold.

2.1.14 Hold & Transfer

KEY "2"

When connected to a station, press "1" - Hold. Dial extension of station to which call is to be transferred. When connected, press "2" - Transfer. Transfer is complete and station which executed transfer is returned to idle. Conference calls excluded.

2.1.15 Hold & Consult

When connected to a station, either party can consult another station. Place call on Hold-Press "1". Key extension of 3rd party. After consultation, press "X" to disconnect. Press "T" to reconnect to held party.

2.1.16 Manual Speech Control

KEY "T"

In a high noise environment, the microphone of a called station may be controlled from the calling station by pressing "T" for push-to-talk operation. Mike of station pressing "T" remains active.

2.1.17 Message Waiting with Tone Alert

KEY "7"

Ability to leave a message on the LCD screen at a called station requesting a return call from the called station. A tone sounds at preprogrammed intervals to alert the called station to the message. LCD display reads "MESSAGE FROM NNN", "RESPOND PRESS T". A maximum of 8 different messages may be stored at a station. When exceeded, the station displays "MESSAGE BOX FULL".

2.1.18 Music/Program Distribution

KEY "097"+ 0- 9

Master stations may select from ten channels of programmed audio sources. Displays "SELECT MUSIC CHANNEL" 0-9. Requires a ECHO-BGM Program Distribution Station for

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each channel.

2.1.19 Mute, Privacy

KEY "9"

Local microphone is temporarily muted for privacy. Station displays: "<MUTE>" for duration of key press.

2.1.20 Partitions

Master stations belonging to the same partition may communicate with each other but are blocked from communicating with stations in a different partition. Master stations belonging to partition 0 may communicate with stations in any of the 99 partitions, in the usual manner, by keying in that station's extension. When a station in partition 0 executes a Group Page, All-Call or P.A. Page access code, that station will display a sub-menu prompt: "ENTER PARTITION". Enter the two digit number 01-99 (leading zeros required) that identifies the partition in which the Group Call, All-Call or P.A. Page is to be directed. The screen that follows is the conventional screen allowing the choice of Page Group Number or P.A. Page Zone.

2.1.21 Mobile Communication

KEY "091"

Sub-menu: "1"=Radio Pocket Page
"2"=Two-way Radio

a. Radio pocket page has two preprogrammed modes: Auto and Manual. ECHO-PS Radio Page Interface Station.

b. Selecting "2", Two-way Radio Interface displays:

"SELECT 2-WAY CHANNEL (0-9)"

(ie) Keying 09120 selects Two-way Radio channel "0". (0600) Press "T" to talk and close PTT contacts, release to listen or "X" to disconnect.

Requires ECHO-2WRI Two-way Radio Interface Station

2.1.22 Preempt/Break-In

KEY "T" [While Busy is Displayed]

Permits authorized stations to interrupt an existing two party conversation. Preempted party is placed on hold. Original connection will auto-reconnect when preemption is terminated. Station preempt authorization may be programmed for: inbound only, outbound only,

both in and out or disabled. Station in DND is exempt.

2.1.23 Privacy

KEY "092"+ 1, 2, 3 or 4

There are four Levels of Station Privacy: Non, Semi, Full and Do-Not-Disturb. A Non-Private and a Semi-Private station both optionally receive a preannounce tone and are automatically connected when called. A Semi-Private station's microphone is muted for privacy until answered by keying "T" or going off-hook. A Full Privacy station receives an interrupted ring and connects when answered by keying "T" or going off-hook. Calling party's LCD displays "RINGING". A Do-Not-Disturb station appears busy to calling stations. Privacy may be changed in the user or program mode.

2.1.24 Public Page Access

KEY "096"

Master stations may access a public address system. Ten (10) per partition. Requires Cat. 4316 Page Interface Station (s).

Displays "SELECT PAGE ZONE" 0-9.

2.1.25 Speed-Dial, Two Digit

KEY "0 (1-7)"

Allows two digit calling to any one of seven pre-programmed extensions. When connected to any station, keying "0 (1-7)" will record/overwrite or delete that extension for future speed-dial. Speed-dial may be changed in user or PC program mode.

2.1.26 Speed-Dial Single Digit

KEY "8 (6-9)"

Allows single digit calling to any one of four pre-programmed extensions. When connected to any station, keying "8 (6-9)" will record/overwrite or delete that extension for future speed-dial. Speed-dial may be changed in user or program mode.

2.1.27 Volume Control

KEY "V" + or -

Digital volume control keys permit independent adjustment of voice or ring tone levels. The keys allow adjustment for loudspeaking and handset operation.

2.1.28 PBX Interface

OUTSIDE PHONE LINE ACCESS

Key "Preprogrammed Access Number"

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Master stations may access an outside phone line. Up to 32 per partition. 0-9 Numeric Keys, "T" KEY= *, "D"(down arrow key)= #, X= Disconnect

INCOMING PHONE CALL

Answer in the usual manner.

Requires ECHO-PBXI PBX Interface.

2.1.29 USER MODE KEYPRESS OPERATIONS SUMMARY

<u>KEY</u>	<u>OPERATION</u>
0 + D up/dn	Help menu
1	Hold
2	Call Transfer
3	Conference Call
4	Door Control at connected sub-station
5	Camp-on Busy
6	Unassigned
7	Leave Message
0 (1-7)	2 Digit Speed-dial pre-programmed station
8 (6,7,8,9)	Add/Delete 1 Digit Speed Dial
<u>KEY</u>	<u>OPERATION</u>
08	Call Forward- No Answer
9	Mute, Privacy
X	Disconnect
T (after pressing D or 3)	Connect to displayed station
	or Conference
T (while connected)	Manual
Speech Control	(PTT Control)
T (while displaying busy)	Preempt Break-in
T (while idle) . . .	Last number redial, Call Last Caller
V +, V -	Volume Control, voice and ring, Help scroll
D arrow up/dn . .	Directory and Help scroll
091	Mobile Communications
0911.	Radio Page
0912.	2-Way Radio
	Select channel (0-9)
092	Privacy, select Non, Semi, ...
	Full or DND
093	Call Forward
094	Provider 680 integration

095	Group Call, select group 1-9
096	P.A. Overhead Page, select 0-9
097	Program Distribution channel, select 0-9
098	All-Call
099+ Password .	Emergency All-Call

2.2 SUB-STATION OPERATION

Call Buttons

Depressing a Call button will place a call to the pre-programmed destination. A Sub-station equipped with a Cancel button may activate it at any time. Connected calls from Sub-stations with no cancel button (E-SSMB1, E-SSSB1, etc.) will time out when the setting for the 'Call Abandonment' timer is exceeded.

2.2.1 STANDARD CALLS:

If the called station is ringing or the audio path is connected, additional button presses are ignored. Std calls are automatically Camped-on if the called Master is busy.

2.2.2 ADMIN CALLS:

If connected to Administrative Master, additional button presses are ignored. If not connected, pressing another button will cancel previous Admin call and place new Admin call. A Sub-station can place only one Admin call at a time. Admin calls will be stacked at Administrative Masters.

2.2.3 OFF-PREMISE CALLS

Multiple sub-stations may be programmed to call off-premise to a single pre-programmed phone number. Requires ECHO-PBXI PBX Interface.

2.3 E-MDS ADMINISTRATIVE MASTER OPERATION

The E-MDS Admin Master offers unique operation when compared to conventional Masters and:

1. Processes Standard calls from conventional Masters or Substations in the same manner as a standard Master station.
2. Processes Admin calls from Substations which have been programmed to place Admin type calls.
3. Provides a user selectable DAY and

and Night Mode by keying 0491. When Night mode is selected the character "N" is displayed in the upper left corner of the LCD. Night ownership includes the Day ownership.

4. Will stack Admin type calls from Substations in a que according to the assigned priority level of the call. Calls may be answered or reviewed in any order using the "D" up/down keys. The More Calls LED indicates additional calls pending. The message "END OF LIST" will momentarily display after the last call is displayed. Up to ten different call text messages may be displayed.

5. Provides Call Placed LEDs and audible tones for Routine and Emergency priority level calls. Tones may be silenced with the Tone Silence key and will resound upon receipt of a new call.

6. Provides seven use programmable keys that allow speed dialing of Master functions of up to 16 characters in length.

To answer the displayed call press the "T" key or lift the handset. To cancel press "X" or hang-up. User may select Day mode by keying 0490

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NIGHT ownership of Admin call Substations.

3.0 INSTALLATION

3.1 LOCATING THE CENTRAL EXCHANGE CABINET

The ECHO-PCX Central Exchange, like most electronic office equipment, should be protected from harsh environmental conditions. To assure reliable operation and easy servicing, several factors should be considered when planning the installation. After completing a site survey but before installing the Central Exchange and wiring:

1. The Central Exchange is designed for wall mounting on a backboard.
2. The power supply operates on +/- 120 VAC 50/160 service. A 3-wire (single phase with ground) receptacle must be provided within three feet of the location of the exchange on a UPS grade power dedicated, suitably fused circuit.
3. Locate the exchange midway between all stations in the system, if possible, to reduce wire runs.
4. A well ventilated area having a recommended temperature range of 70 to 78 deg. F (21-26 deg. C) and humidity range of 5 to 90% relative humidity (non-condensing) measured 5ft. (1.5m) above floor level.
5. Adequate lighting and accessibility for servicing.
6. Protection from flooding, flammable materials, excessive dust and vibration.
7. Away from of arc welding, high power transmitting equipment or other electrical equipment capable of generating electrical interference.
8. Access to a good earth ground.
9. Specify how station cable will be routed and managed in the location of the central exchange.
10. Any exchange wiring extending outside of

the building should be equipped with primary and secondary protection devices because of possible exposure to lightning transients. This type of protection equipment is available through telephone equipment supply houses.

3.2 SYSTEM WIRING

3.2.1 Station Wire and Cable

Specifications (See Fig. 3.5a, 3.8, 3.10)

- 1.) One twisted pair, non-shielded cable per line.
- 2.) Maximum attenuation per line 24dB @ 160kb/s
- 3.) Maximum loop resistance is 170 Ohms
- 4.) Range: 1.2mi. (2km)
with -EXT option 2.4mi. (4km)
- 5.) Levels: AC- 1.2Vpp; DC- 28Vdc
- 6.) Format: (2B+D) compatible to ISDN basic rate
- 7.) Line code: Biphasic with differential encoding
- 8.) Use Table to determine minimum AWG gauge

TABLE 3.2.1.8

ECHO-LC Line Card:

<u>AWGMax. Distance</u>	
24	2000 ft. (608m)
22	4500 ft. (1368m)
20	6336 ft. (2000m)
cat 5	6000 ft.
cat 3	6000 ft.

ECHO-LC-X Line Card:

<u>AWGMax. Distance</u>	
24	12,672 ft. (4000m)

- 9.) Use twisted pair, non-shielded (UTP) telephone cable Category 3 Compliant or greater such as General Cable Multi-pair Inside Wire or equal.

3.2.2 Exchange Cable Installation Specifications

- 1.) A maximum of one station may be connected to a Line Card Output. Multiple stations may not be paralleled on the same extension line.
- 2.) Bridged taps are not allowed. (Multiple appearances of the same cable pair at several distribution points, also known as parallel connections or unused tapoff connections.) Bridge taps are most commonly encountered with existing wiring.
- 3.) Splices are not recommended. Keep to a minimum where required.

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- 4.) Pair twists should be maintained as close as possible to the point of termination and untwisting should not exceed 2 in.
- 5.) System wiring should be isolated from high levels of interference or noise.
- 6.) All system wiring should be electrically isolated from earth/ building ground except for the building ground conductor on the cabinet ground and the power entry cable.
- 7.) Component and cable installation procedures are subject to Factory Wiring Requirements, N.E.C. and Local Codes of the Authority Having Jurisdiction (AHJ).

3.2.3 Mother Board Interconnection

Two ECHO-MB Mother Boards may be connected together via ECHO-MC Modem Cards. Set DIP Switch (S2) on each ECHO-MB Mother Board according to Figure 3.9.

3.2.3.1 Metallic Cable Digital Switch Interconnect

Two twisted pairs of 22 Ga. inside telephone cable. Maximum distance 1000 feet (304m). (See Fig. 3.5b).

3.2.3.2 Fiber Optic Digital Switch Interconnection

Fiber optic interconnection of two ECHO-MB Mother Boards may be accomplished with no additional exchange equipment. The fiber link uses two International Fiber Systems modems Series D1200 or equal (supporting G.703) for distances of up to 46 miles (75km). (See Fig. 3.5d).

3.2.4 Fiber Optic Connection of a Single Station to the Central Exchange.

Fig 3.5c, 3.12 The ECHO-FOTI Fiber Optic Interfaces are used with International Fiber Systems modems Series D1100, or equal, for distances of up to 30 miles (49km).

3.2.5 Protection for Off-Premise Wiring

The metallic field wiring connections between the ECHO-LC Line Card Module and any intercom station are intended to be made on-premise with both ECHO-LC Line Card and its associated Station(s) located within the same building.

When wiring extends outside the building in which the Central Exchange is installed, the wiring must be protected from direct or indirect contact with lightning, power lines or electrostatic discharge to protect equipment and personnel.

Primary and secondary devices should be installed at the Station and Central equipment sides to divert the surge energy to ground. Most large telephone equipment supply distributors carry appropriate protection solutions. Surge voltages should be clamped to less than 50 volts.

Alternately, intercom equipment may be interfaced with fiber optic lines which offer immunity to off-premise hazards. See wiring diagram Fig. 3.5c or 3.5d.

3.3 MASTER STATION INSTALLATION

3.3.1 Master Call Station E-IST OPERATION

The E-IST Master Call Station can call any other station in the system and is capable of duplex loudspeaking voice communication with the panel microphone and speaker. Since the digital central exchange can process all calls simultaneously, there is no dial tone or delay. After keying in the extension, the call can be connected immediately. The keypad provides tactile and audible feedback for positive activation. The LCD display at each Master station shows the called and calling station

ID. A station may be preset to any of four levels of privacy for receiving calls; Non-Private, Semi-Private, Full Privacy, and Do Not Disturb. The volume for voice and signal may be adjusted by means of the digital volume keys on the keypad.

EQUIPMENT

The compact station is constructed of heavy gauge anodized aluminum with a mylar faceplate and is equipped with a standard 16 button keypad and LCD display with Two-Lines of 16 characters. The unit is intended for indoor use with flush E-BB2 backbox or E-SMB surface box (See Fig. 3.1 and 3.2).

ECHO - PCX INSTALLATION MANUAL

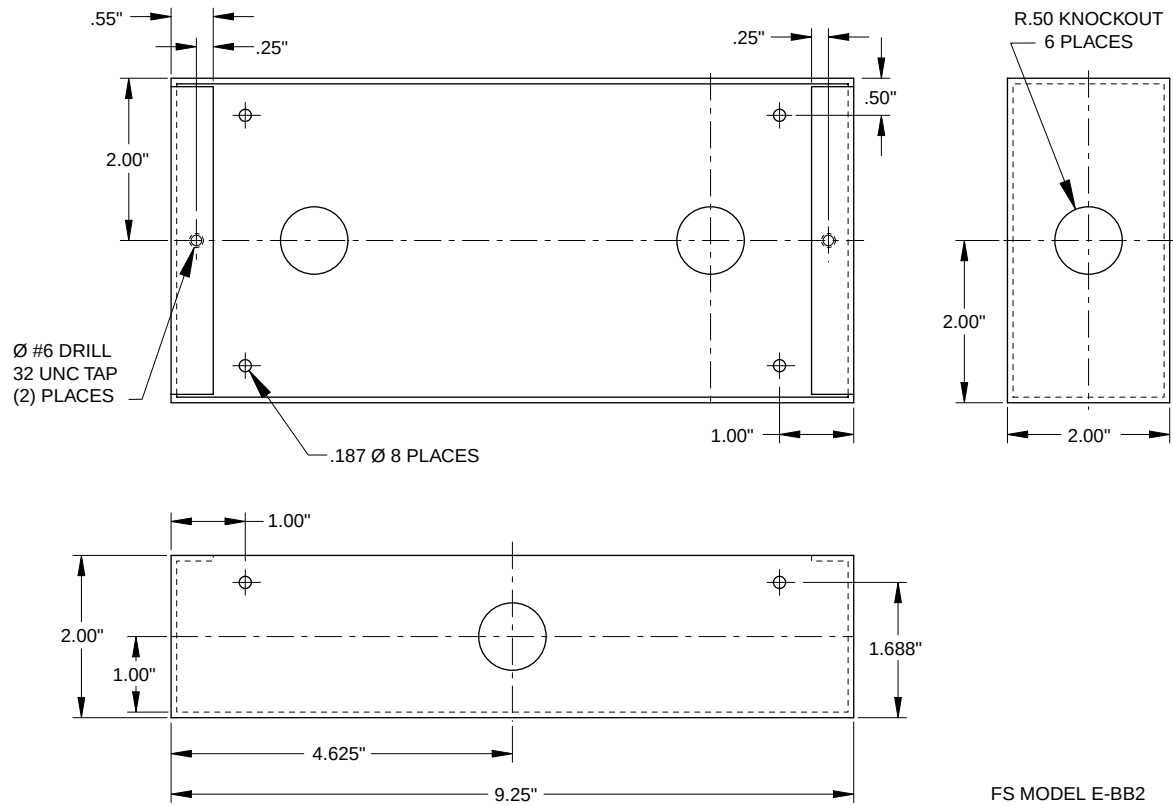


Figure 3.1

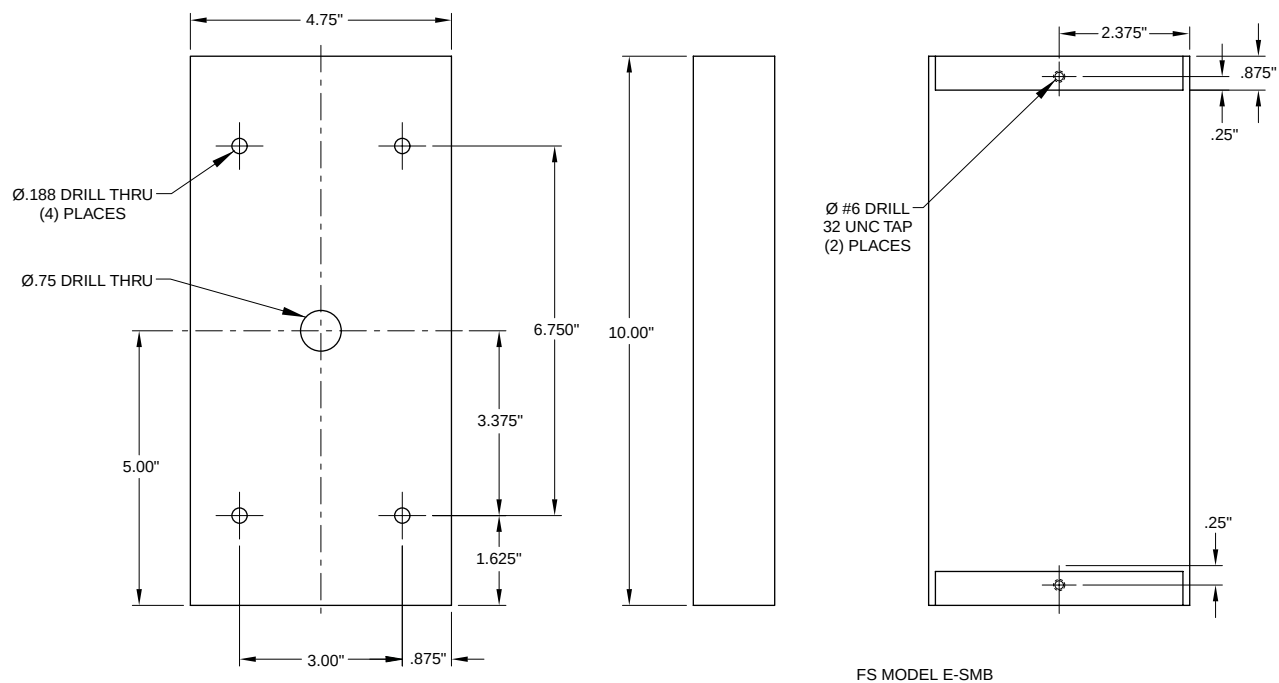


Figure 3.2

ECHO - PCX INSTALLATION MANUAL

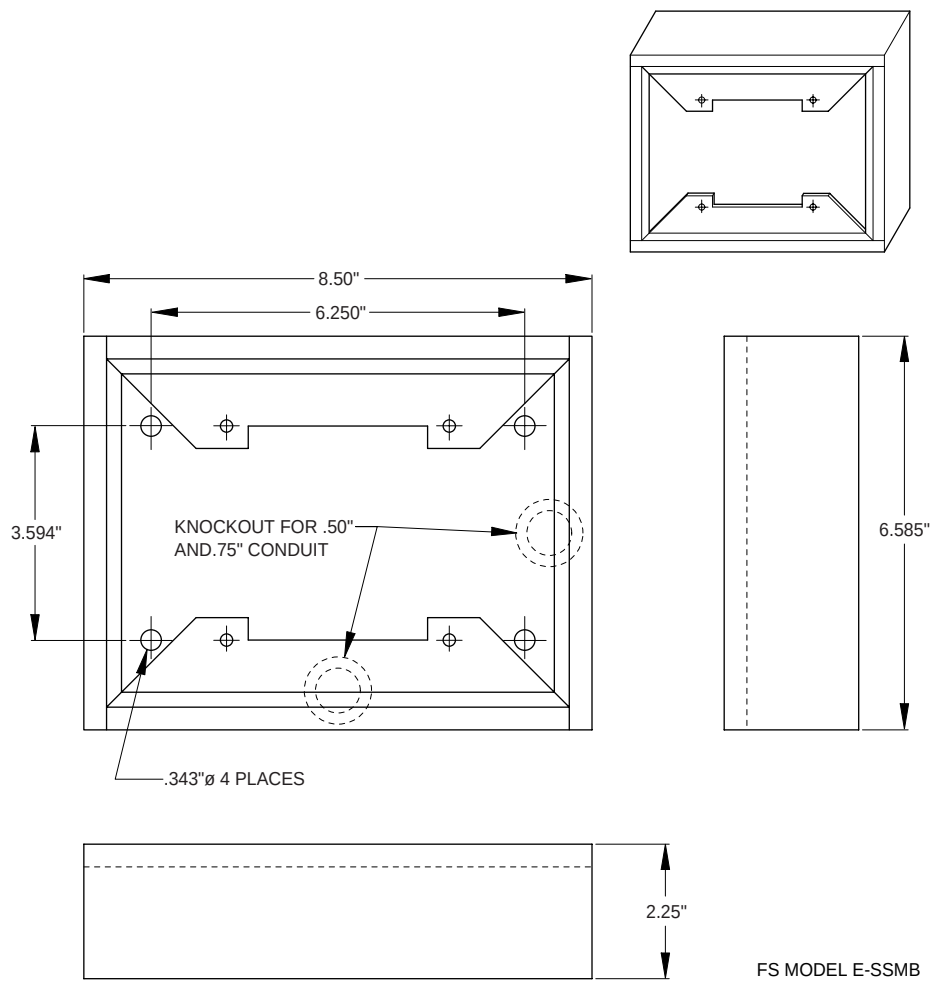


Figure 3.3

ECHO - PCX INSTALLATION MANUAL

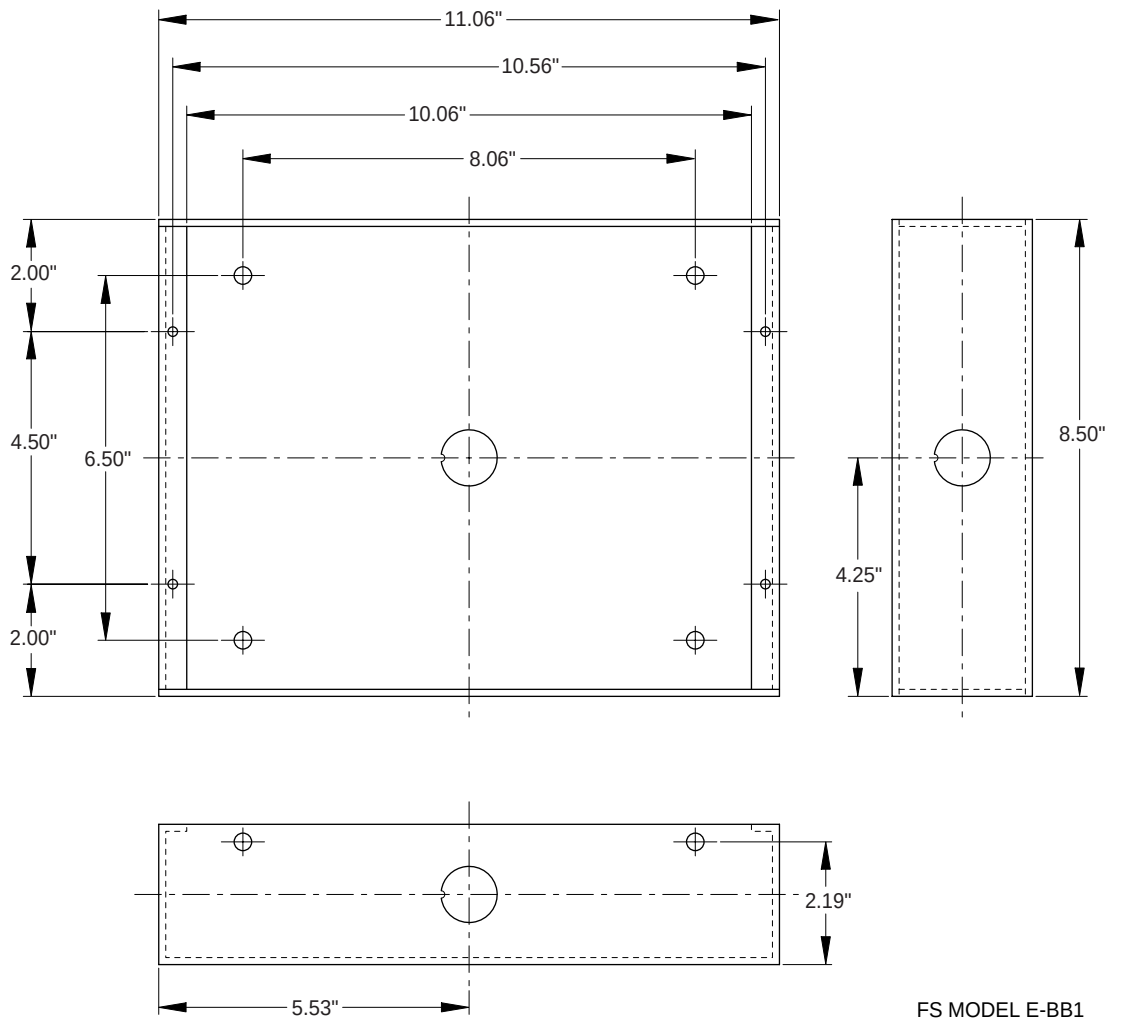


Figure 3.4

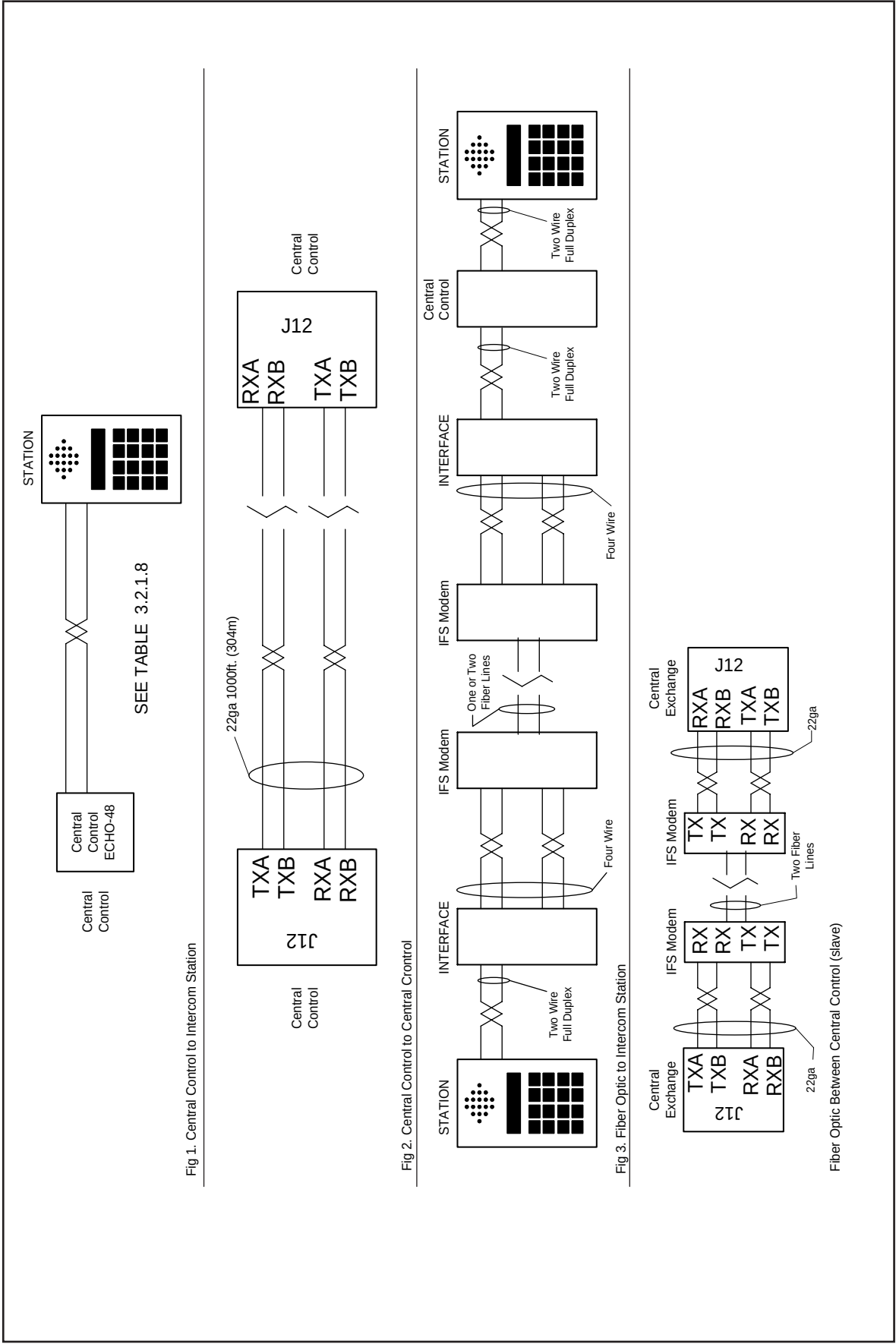
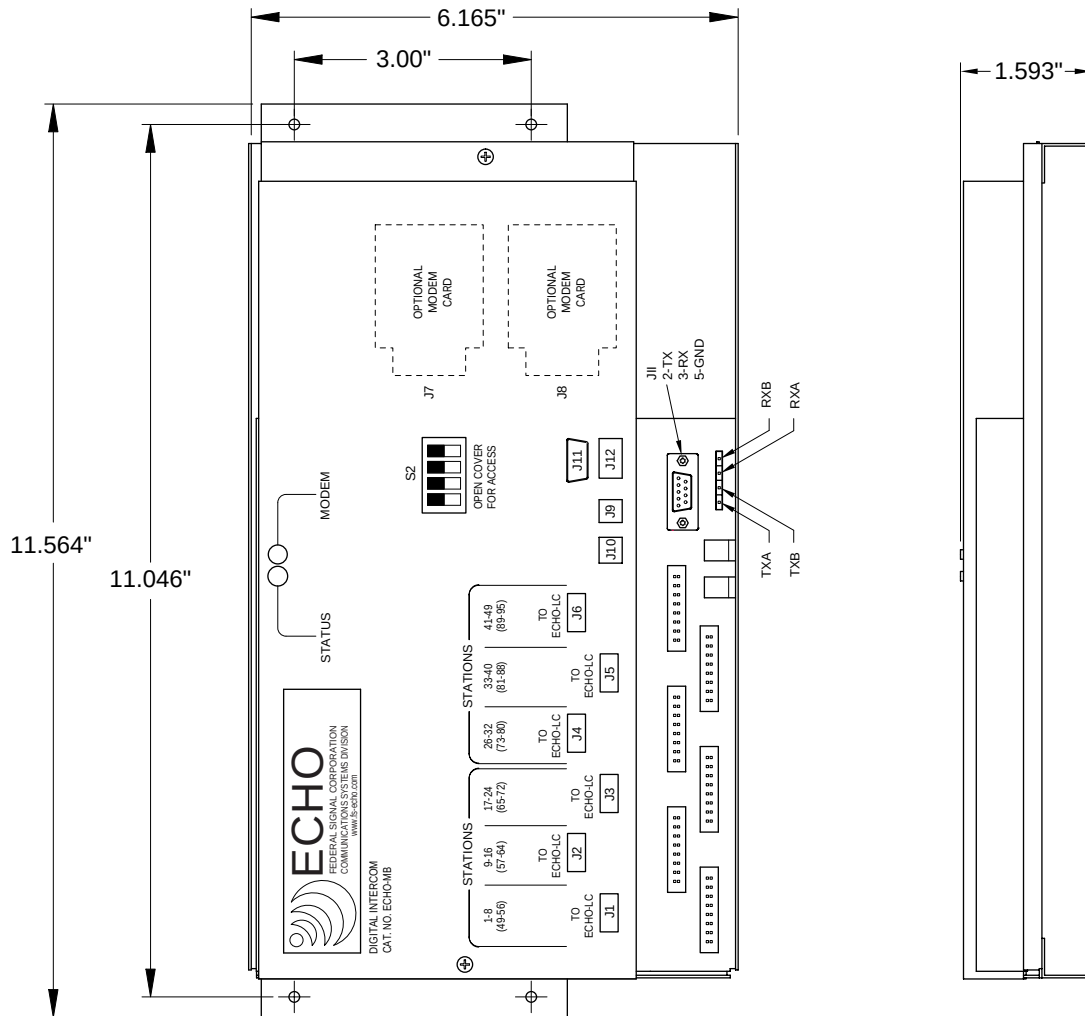


Figure 3.5a,b,c,d

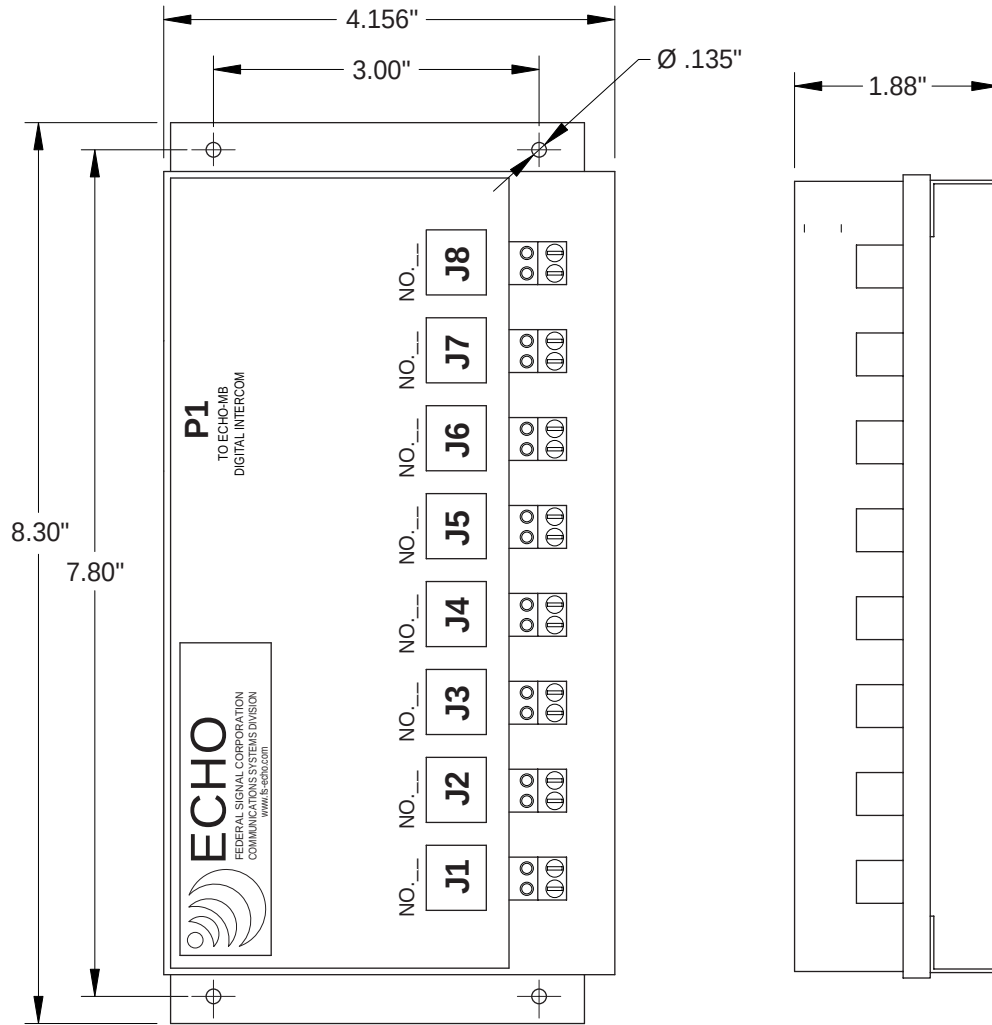
ECHO - PCX INSTALLATION MANUAL



FS MODEL ECHO-MB
UTILIZE FS MYLAR KEYPAD OVERLAY
PART NO. 81461804A

Figure 3.6

ECHO - PCX INSTALLATION MANUAL

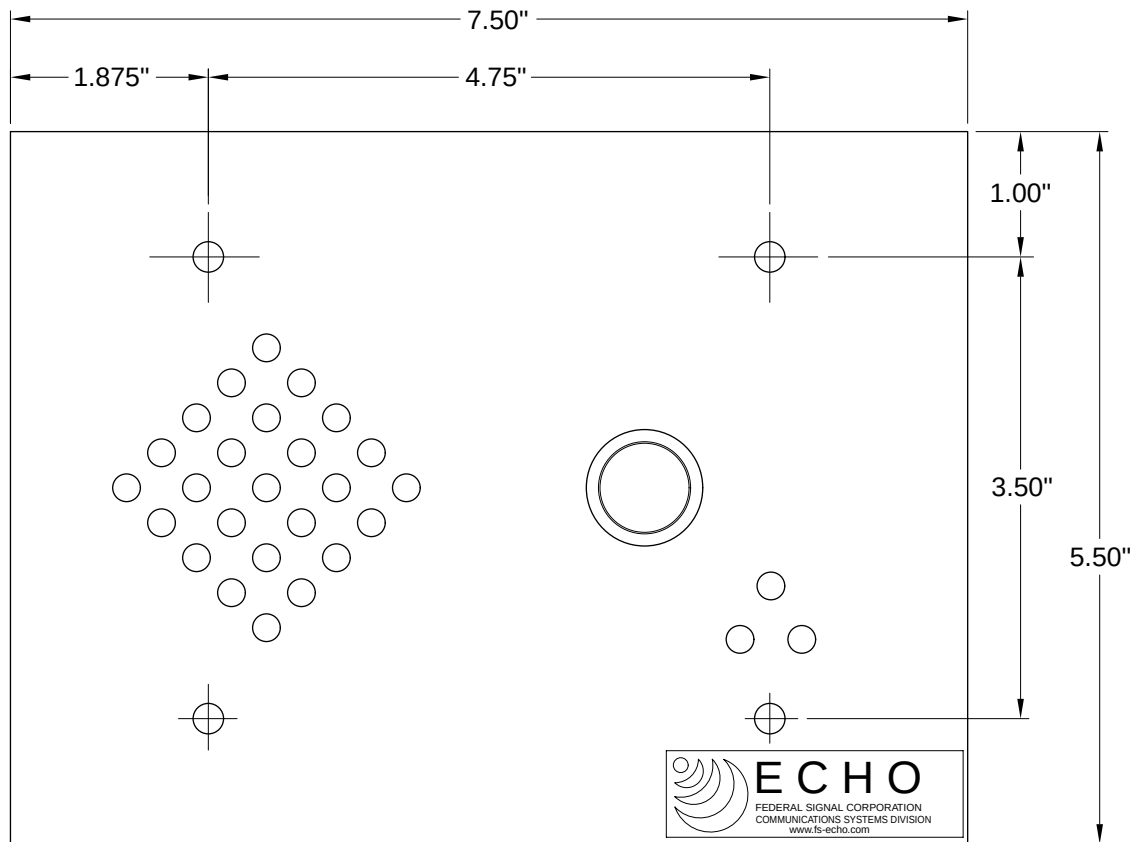


FS MODEL ECHO-LC

UTILIZE FS MYLAR KEYPAD OVERLAY
PART NO. 81461805

Figure 3.7

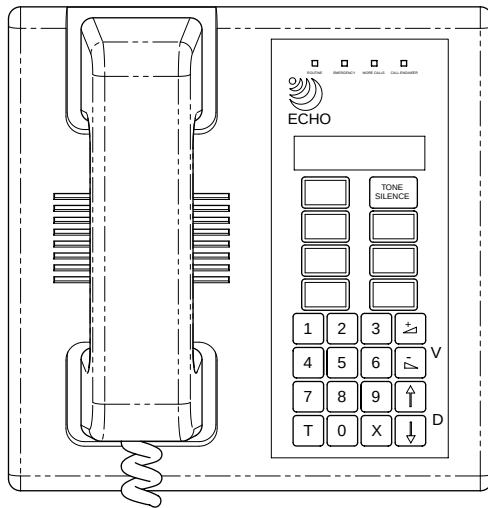
ECHO - PCX INSTALLATION MANUAL



FS MODEL E-SSSB1
UTILIZE FS MYLAR KEYPAD OVERLAY
PART NO. 81461803A

Figure 3.8

ECHO - PCX INSTALLATION MANUAL



FS MODEL E-MDS
UTILIZE FS MYLAR KEYPAD OVERLAY
PART NO. 81461799A

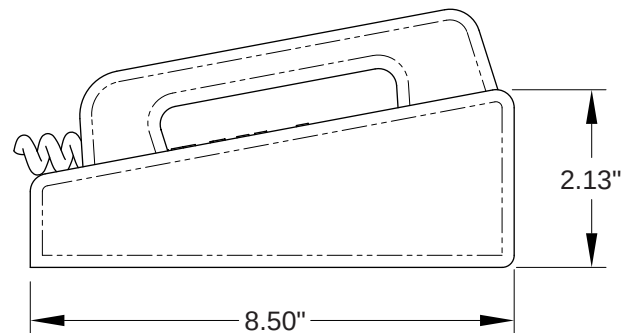
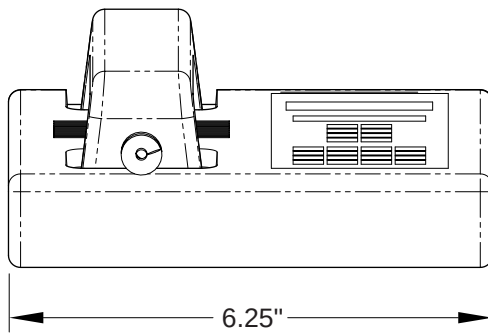


Figure 3.9

ECHO - PCX INSTALLATION MANUAL

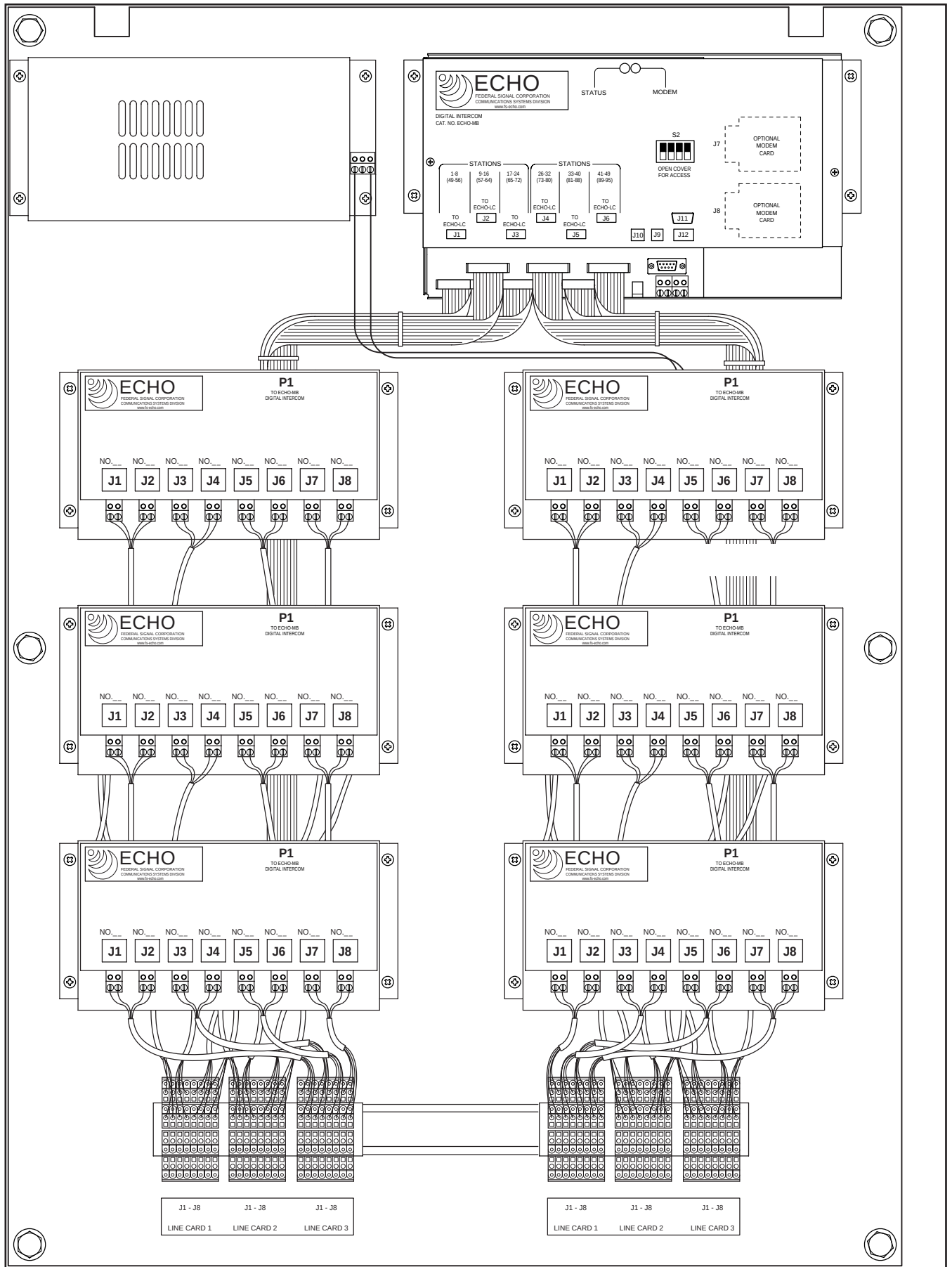


Figure 3.10

ECHO - PCX INSTALLATION MANUAL

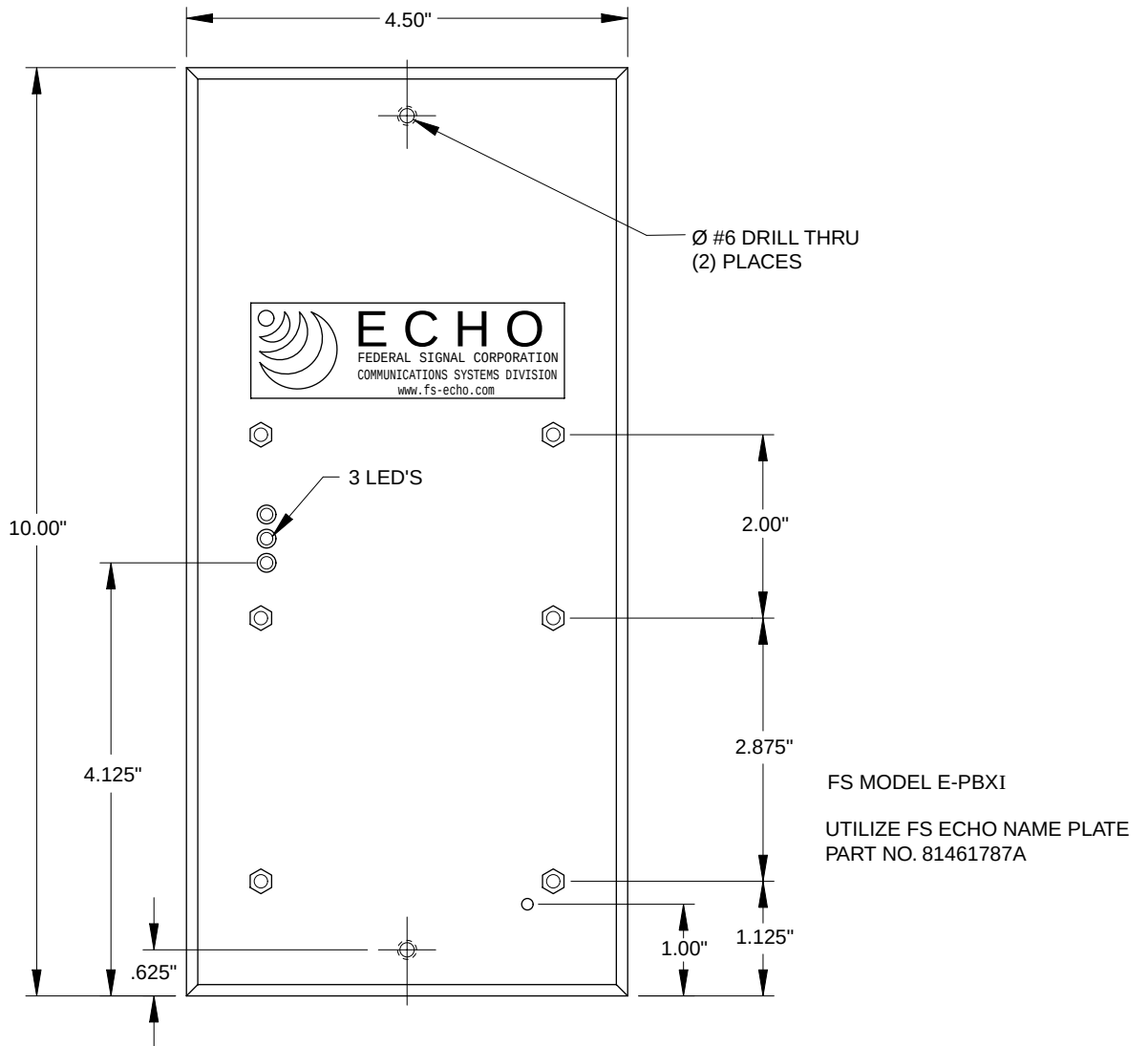
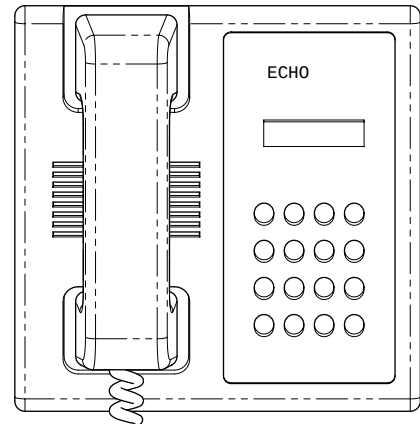
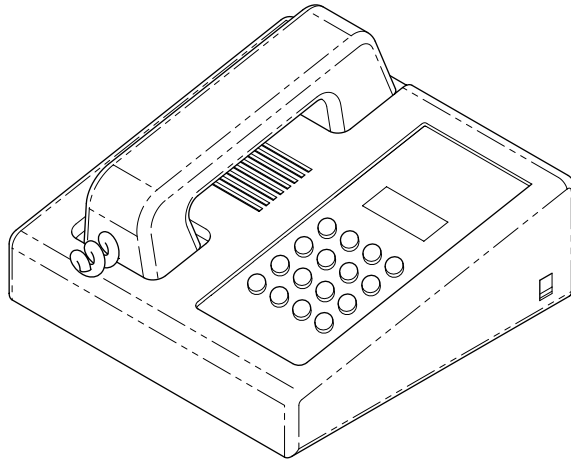


Figure 3.11

ECHO - PCX INSTALLATION MANUAL



FS MODEL E-DST

UTILIZE FS MYLAR KEYPAD OVERLAY
PART NO. 81461796A

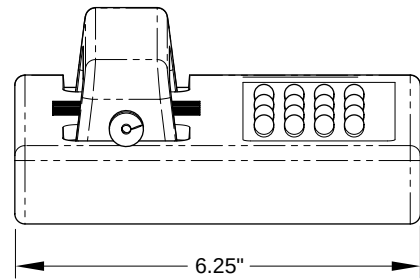
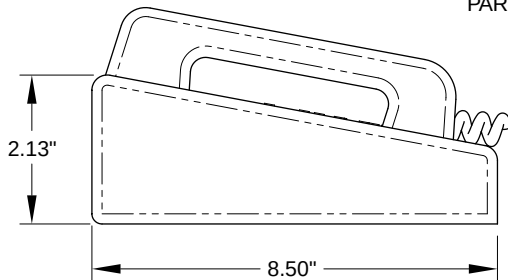


Figure 3.12

ECHO - PCX INSTALLATION MANUAL

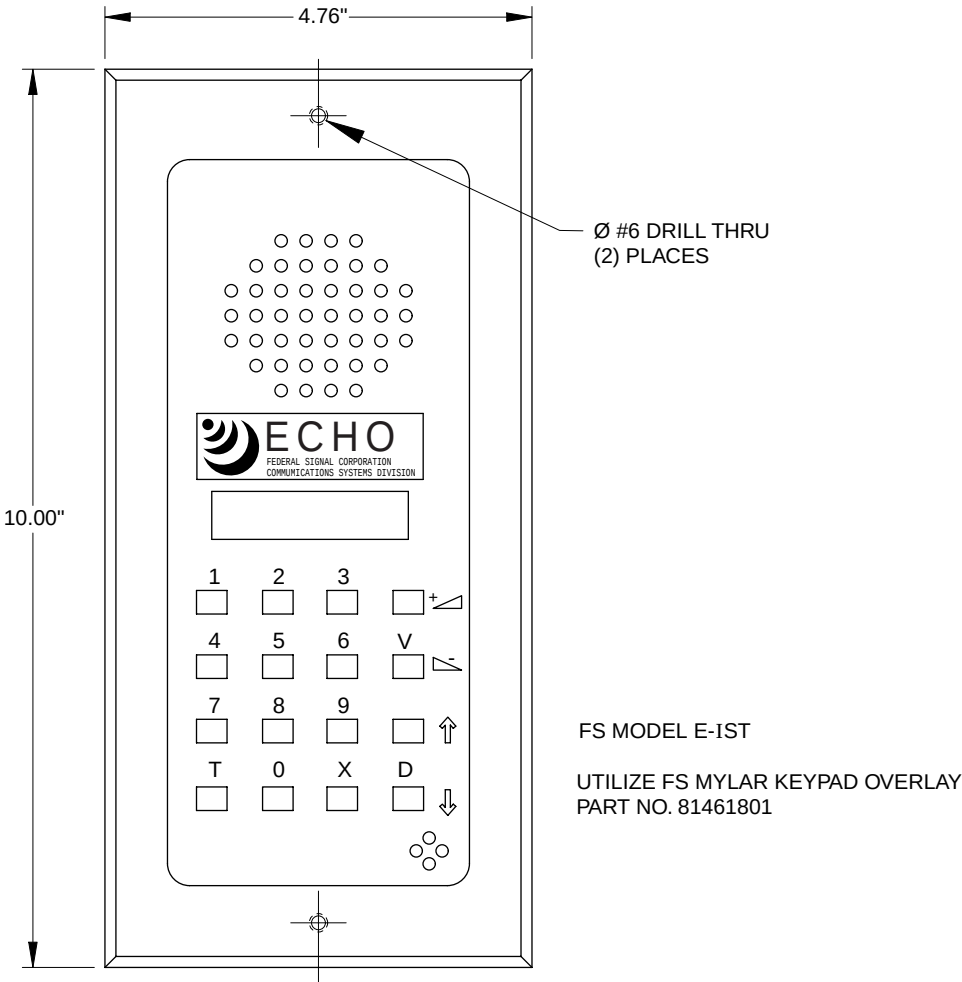


Figure 3.13

ECHO - PCX INSTALLATION MANUAL

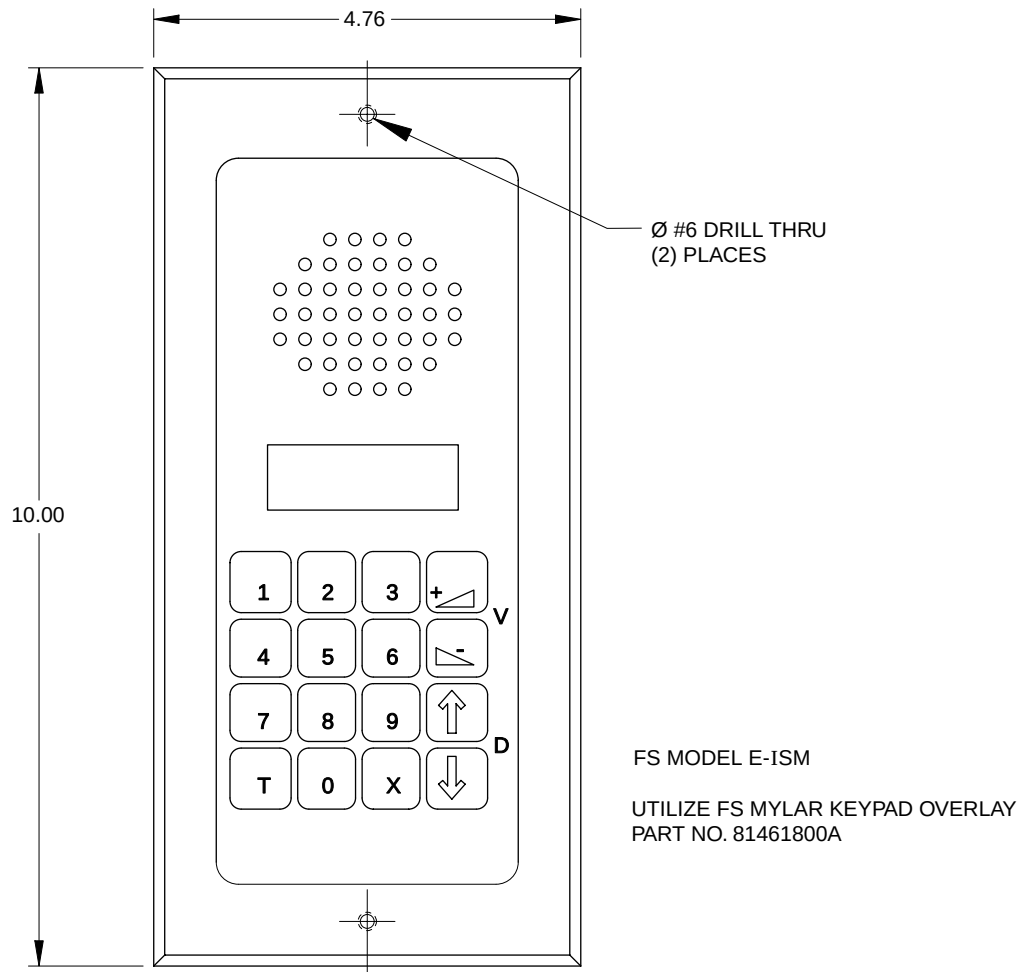
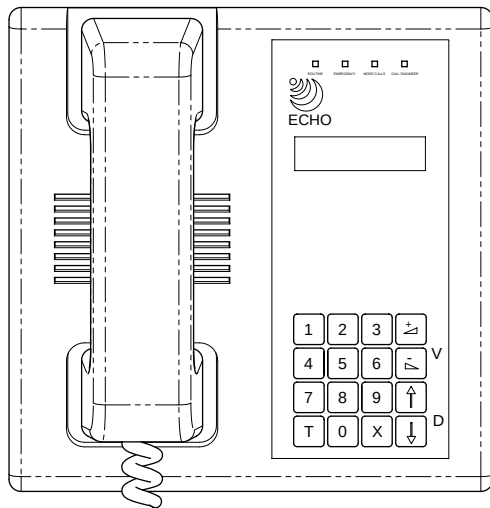


Figure 3.14

ECHO - PCX INSTALLATION MANUAL



FS MODEL E-DST
UTILIZE FS MYLAR KEYPAD OVERLAY
PART NO. 81461798A

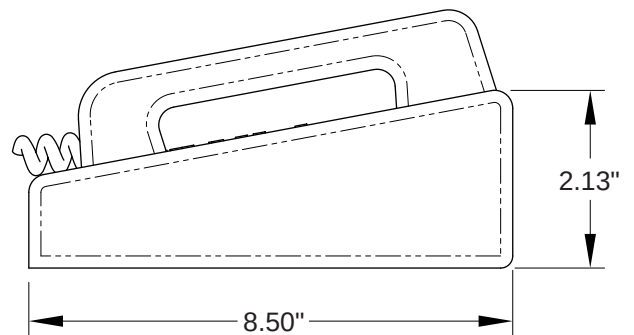
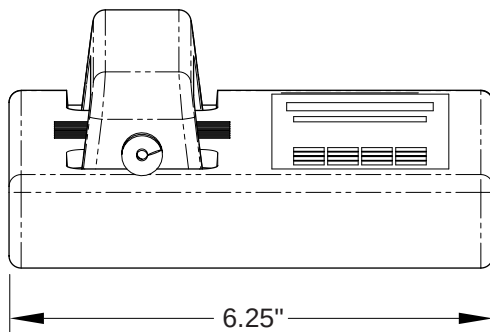


Figure 3.15

ECHO - PCX INSTALLATION MANUAL

TECHNICAL DATA

Dimensions (WxDxH):

4.75 x 1.75 x 10.0 in. (12 x 4.4 x 25.4 cm.)

Rated Input:

Voltage: 24Vdc nominal

Current:

Idle: .025A

Connected: .065A

Amplifier Output:

1.0W

Speaker:

Size: 2.5 in.

Impedance: 45 ohm

Microphone:

Type: electret

Sensitivity: -70dB

Keypad:

16 buttons, Grey Conductive Rubber

Volume Control:

30 dB in 10 steps

Line Specifications:

Attenuation: 24dB @ 160kb/s Max.

Loop Resistance: 170 Ohm Max.

Distance:

1.2 mi. (2km) Max.

2.4 mi. (4km) when equipped with -EXT

Extended Range Option and used with ECHO-LC-X Line Card and local Power Supply

Cable: One Twisted Pair, Non-Shielded

Standards Compliance:

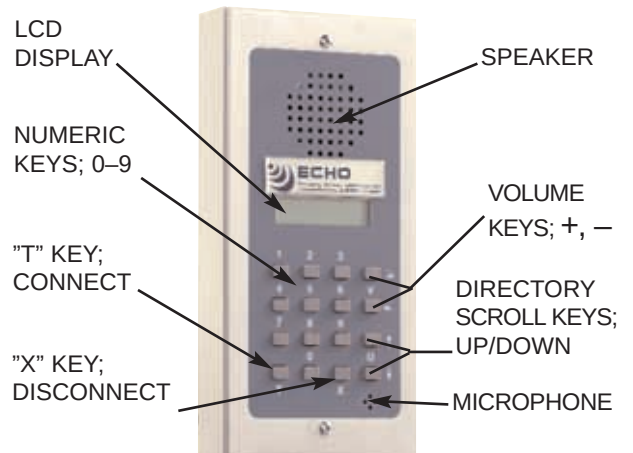
Overtoltage and Current:

CCITT K20 and BELLCORE TR-NWT-

000974

Termination:

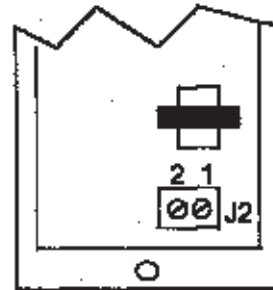
Plug-in screw terminal, Non-Polar



DESCRIPTION OF FRONT PANEL CONTROLS AND INDICATOR

E-IST Master Call Station

DESCRIPTION OF INSTALLER TERMINALS



J2 1-2, POWER/DATA (NON-POLAR)

3.3.2 Master Call Station E-ISM OPERATION

Calling any station in the system is simplified since the digital central exchange can process all stations simultaneously. There is no dial tone or delay. Just key-in the extension and your call can be connected immediately. The keypad provides tactile and audible feedback for positive activation. The LCD display at each station shows the called and calling station ID.

A station may be preset to any of four levels of privacy; Non-Private, Semi-Private, Full Privacy, and Do Not Disturb. The volume for voice and signal may be adjusted by means of the digital volume keys on the keypad.

ECHO - PCX INSTALLATION MANUAL

EQUIPMENT

The compact station is constructed of heavy gauge anodized aluminum with a smooth mylar faceplate and is equipped with a flush 16 button keypad to eliminate crevices and an LCD display with Two-Lines of 16 Characters each. The unit is intended for indoor use with flush E-BB2 backbox or E-SMB surface box (See Fig. 3.1 and 3.2).

TECHNICAL DATA

Dimensions (WxDxH):

4.75 x 1.75 x 10.0 in. (12 x 4.4 x 25.4 cm.)

Rated Input:

Voltage: 24Vdc nominal

Current:

Idle: .025A

Connected: .065A

Amplifier Output:

1.0W

Speaker:

Size: 2.5 in.

Impedance: 45 ohm

Microphone:

Type: electret

Sensitivity: -70dB

Keypad:

16 buttons, flush membrane

Volume Control:

30 dB in 10 steps

Line Specifications:

Attenuation: 24dB @ 160kb/s Max.

Loop Resistance: 170 Ohm Max.

Distance: 1.2 mi. (2km) Max.

2.4 mi. (4km) when equipped with -EXT Extended Range Option and used with ECHO-LC-X Line Card and local Power Supply

Cable: One Twisted Pair, Non-Shielded

Standards Compliance:

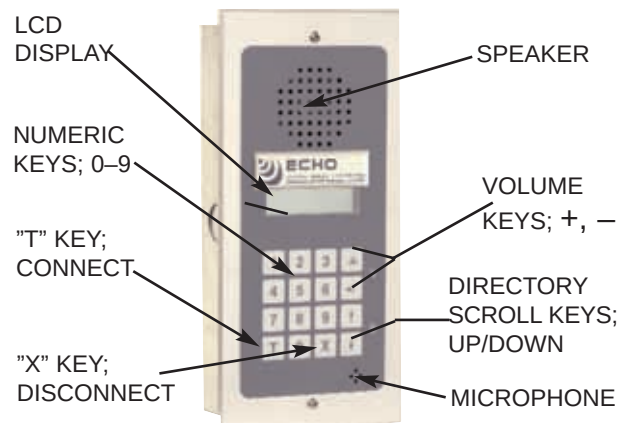
Overvoltage and Current:

CCITT K20 and BELLCORE TR-NWT-000974

Termination:

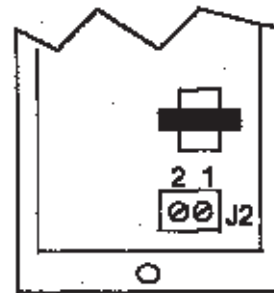
Plug-in screw terminal, Non-Polar

DESCRIPTION OF FRONT PANEL CONTROLS AND INDICATOR



E-ISM Master Call Station

DESCRIPTION OF INSTALLER TERMINALS



J2 1-2, POWER/DATA (NON-POLAR)

3.3.3 Master Call Station E-DSM/E-DST OPERATION

The E-DSM Handset Call Station can call any other station in the system and is capable of full duplex communication using the handset. Since the Digital Central Exchange can process all calls simultaneously, there is no dial tone or delay. After keying in extension, the call can be connected immediately. The keypad provides tactile and audible feedback for positive activation. The LCD display at each Master station shows the called and calling station ID. A station may be preset to any of four levels of privacy for receiving calls; Non-Private, Semi-Private, Full Privacy, and Do Not Disturb. The keypad volume keys may be used to adjust the volume for both handset and hands-free operation.

ECHO - PCX INSTALLATION MANUAL

EQUIPMENT

The compact console unit is equipped with a handset as well as panel speaker and electret microphone. A standard 16 button keypad and LCD display with Two Lines of 16 characters each is provided. The unit is furnished in a light ash tone console with matching handset intended for indoor use in a desktop or wall mount application.

TECHNICAL DATA

Dimensions (WxDxH):

6.25 x 8 x 3 in. (16 x 20.3 x 7.6 cm)

Rated Input:

Voltage: 24Vdc nominal

Current:

Idle: .025A

Connected: .065A

Amplifier Output:

1.0W

Speaker:

Size: 2.5 in.

Impedance: 45 ohm

Microphone:

Type: electret

Sensitivity: -70dB

Keypad:

E-DSM: 16 buttons, Membrane Type

E-DST: 16 buttons, Grey Conductive

Rubber

Volume Control:

30 dB in 10 steps

Line Specifications:

Attenuation: 24dB @ 160kb/s Max.

Loop Resistance: 170 Ohm Max.

Distance:

1.2 mi. (2km) Max.

2.4 mi. (4km) when equipped with -EXT

Extended Range Option and used with ECHO-LC-X Line Card and local Power Supply

Cable: One Twisted Pair, Non-Shielded

Standards Compliance:

Overvoltage and Current:

CCITT K20 and BELLCORE TR-NWT-000974

Termination:

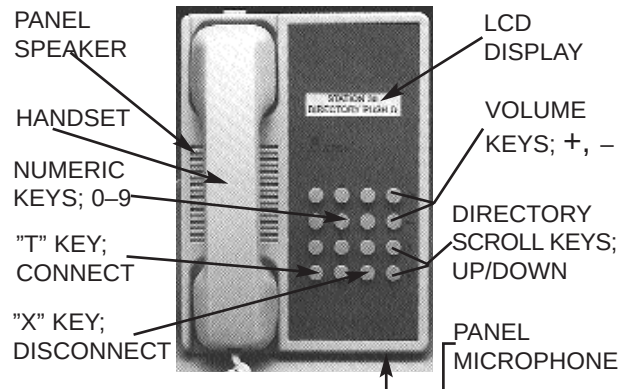
RJ-11, Non Polar

Handset:

Electret Microphone

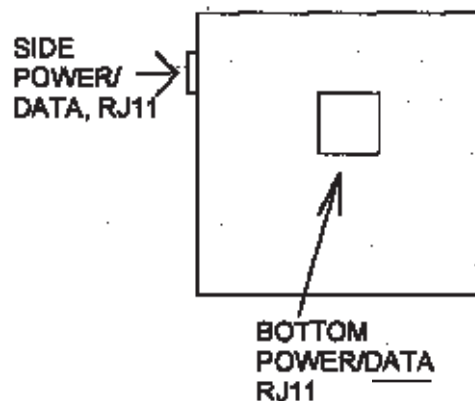
Receiver Element

DESCRIPTION OF HANDSET CALL STATION



E-DST Handset Call Station

DESCRIPTION OF INSTALLER TERMINALS



3.4 SUB-STATION INSTALLATION

3.4.1 Single and Multi Call Sub-Stations E-DD1/E-DD2/E-SSSB3/E-SSSB4

OPERATION

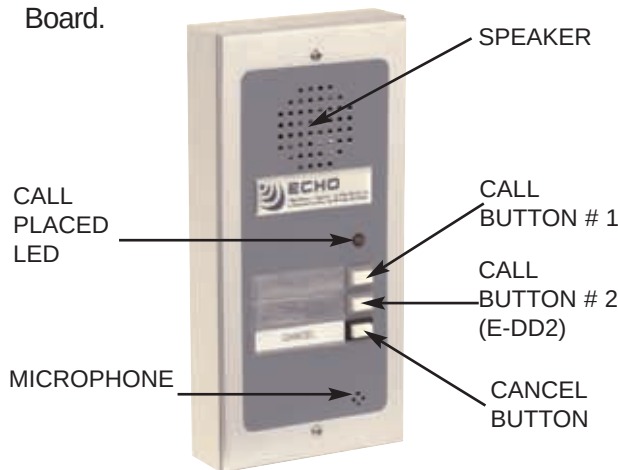
The E-DD1/E-DD2/E-SSSB3/E-SSSB4 Single and Multi Call Sub-Stations may be preprogrammed to call any other station in the system. E-DD1 Single Call Stations can call one location, other Call Stations can call multi locations. By pressing the Call button on the station, a call will be placed to the station at the preprogrammed location. When a call is placed the Call Placed LED will illuminate. A call may be canceled by depressing the cancel button. Built-in relay contacts may be activated from the calling Master Station for door

ECHO - PCX INSTALLATION MANUAL

control.

EQUIPMENT

The E-DD1/E-DD2/E-SSSB3/E-SSSB4 Call Stations are constructed of heavy gauge anodized aluminum with a rugged mylar faceplate. The E-DD1 Single Call Station is equipped with one Call and one Cancel button and a Call Placed LED. The E-DD2 Dual Call Station has two Call buttons, one Cancel button and a Call Placed LED. All units have built-in, heavy-duty relay contacts. The units are intended for indoor use with flush E-BB2 Backbox or E-SMB Surface Box (See Fig. 3.1 and 3.2). The E-DD1/E-DD2/E-SSSB3/E-SSSB4 Stations may be programmed for call destination, volume level and other features using any Master Station connected to the same Mother Board.



E-DD2 Dual Call Sub -Station

TECHNICAL DATA

Dimensions (WxDxH):

4.75 x 1.75 x 10.0 in. (12 x 4.4 x 25.4 cm.)

Operating

Voltage: 24Vdc nominal

Current:

Idle: .025A; Connected: .065A

Amplifier Output:

1.0W

Speaker:

Size: 2.5 in.

Impedance: 45 ohm

Microphone:

Type: electret

Sensitivity: -70dB

Controls/Indicators:

E-DD1 one Call, one Cancelbutton, one Call

LED

E-DD2 two Call, one Cancel button, one Call

LED

E-SSSB3 three Call, one Cancel button, one Call

LED

E-SSSB4 four Call, one Cancel button, one

Call LED

Relay Contact Rating:

5A @ 24V

Volume Control:

30 dB in 10 steps, Remote

Line Specifications:

Attenuation: 24dB @ 160kb/s Max.

Loop Resistance: 170 Ohm Max.

Distance: 1.2 mi. (2km) Max.

2.4 mi. (4km) when equipped with -EXT Extended Range Option and used with ECHO-LC-X Line Card and local Power Supply

Cable: One Twisted Pair, Non-Shielded

Standards Compliance:

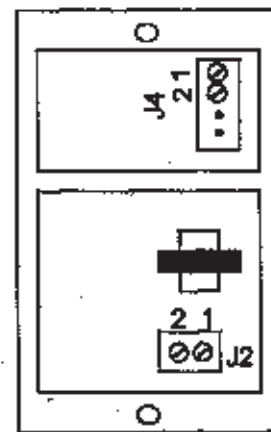
Overvoltage and Current:

CCITT K20 and BELLCORE TR-NW 000974

Termination:

Plug-in screw terminal, non-polar

DESCRIPTION OF SINGLE AND DUAL



J2 1-2, POWER/DATA (NON-POLAR)

J4 1-2, N.O. RELAY CONTACTS

CALL SUB-STATIONS

DESCRIPTION OF INSTALLER TERMINALS

3.4.2 High Security Call Station E-SSMB1/E-SSSB1/E-SSSB2

OPERATION

Depressing a single call button will place a call to any preprogrammed station in the system.

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Built-in relay contacts may be activated from the connected Master station for door or camera control. The panel speaker and electret microphone provide hands-free duplex communication and a digital signal processor automatically adjusts the volume levels to compensate for acoustically difficult locations.

EQUIPMENT

The E-SSMB1/E-SSSB1/E-SSSB2 High-Security Call Station faceplate is constructed of 11 gauge stainless steel with a brushed finish and furnished with a tamper resistant call switch(es) and tamper resistant mounting fasteners. A moisture-resistant speaker is protected by internal protective plated steel baffles against tampering or moisture. The E-SSMB1/E-SSSB1/E-SSSB2 station may be programmed for call destination and volume level from any master station connected to the same Mother Board. The E-SSMB1 is equipped with a mushroom type call button.

RELAY OPERATION

High Security Stations E-SSMB-1 and E-SSSB1 may be field programmed for two modes of relay operation. Ver. CS30

Mode 1. REMOTE CONTROL; Substation relay can be remotely energized from a Master station by pressing the # "4" key while connected. This mode is used to activate a door release at the Substation location.

Mode 2. CALL CONTROL; Substation relay is automatically energized when a call button is pressed at the Substation. The relay remains energized until the call (audio) is canceled from the called station. This mode may be used to activate a Lightning series Strobe light.

Note: When mode 2, CALL CONTROL is used, mode 1, REMOTE CONTROL is inoperative.

A jumper block JP1 is used to select the operating mode 1 or 2 and is accessible to the installer on the station printed circuit board.

TECHNICAL DATA

Dimensions (WxDxH):

5.5 x 3 x 7.5 in. (14 x 7.6 x 19 cm.)

Operating:

Voltage: 24Vdc nominal

Current: Idle: .025A; Connected: .065A

Amplifier Output:

1.0W

Speaker:

Size: 2.5 in.;

Impedance: 45 Ohm

Microphone:

Electret

Controls:

E-SSMB1 One Red Mushroom type Call button, momentary contact

E-SSSB1 One Call button, momentary contact

E-SSSB2 Two Call buttons, momentary contact

Relay Contact:

5A @ 24V

Volume Control:

30dB 10 steps, remote

Line Specifications:

Attenuation: 24 dB @ 160kb/s

Loop Resistance: 170 Ohm

Distance: 1.2 mi. (2km)

2.4 mi. (4km) when equipped with -EXT Extended Range Option and used with ECHO-LC-X Line Card and local Power Supply

Cable: One Twisted Pair, Non-shielded

Standards Compliance:

Overvoltage and Current:

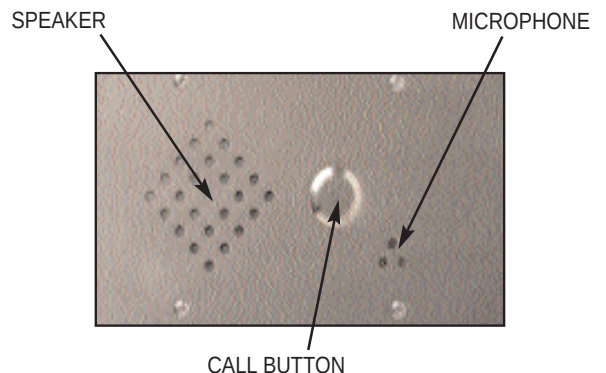
CCITT K20 and BELLCORE TR-NW

000974

Termination:

Plug-in screw terminal, non-polar

DESCRIPTION OF HIGH SECURITY CALL STATION



E-SSB1 High-Security Call Station

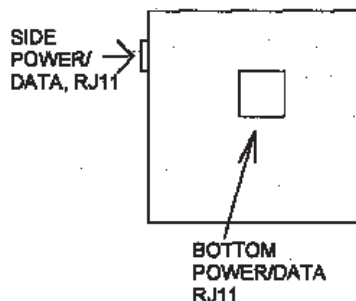
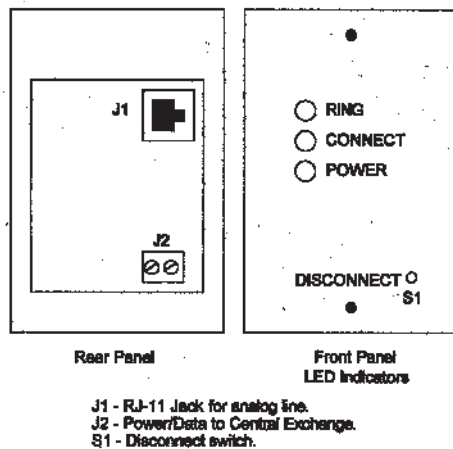
ECHO - PCX INSTALLATION MANUAL

3.5 SPECIAL STATION INSTALLATION

3.5.1 ECHO-PAI PUBLIC ADDRESS STATION

Used to interface the ECHO-PCX System with a P.A. Page amplifier. J2 of the ECHO-PAI connects to a line extension position on a ECHO-LC Line Card. A balanced audio pair and a N.O. relay contact output for amplifier mute are terminated on screw terminal block J4. The unit flush mounts on a E-BB2 back box (See Fig. 3.1).

DESCRIPTION OF INSTALLER TERMINALS



3.5.2 ECHO-BGM PROGRAM DISTRIBUTION STATION

Used to interface an audio background program source with the ECHO-PCX System. The balanced input of the ECHO-BGM connects to the low level output of an audio program source. J2 of the ECHO-BGM connects to a line extension position on a ECHO-LC Line Card. J4 is provided for field termination of the low level music source. The unit flush mounts in a E-BB2 back box (See Fig. 3.1).

3.5.4 ECHO-2WRI

TWO-WAY RADIO INTERFACE

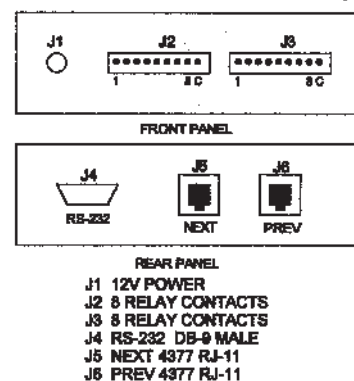
Used to interface the ECHO-PCX System with a Two-Way Radio Base Station.

J2 of the ECHO-2WRI connects to a line extension position on a ECHO-LC Line Card. J4 is used to interface to the Base Station for two-way audio and PTT. Unit Flush Mounts in a E-BB2 Backbox (See Fig. 3.1).

3.5.6 ECHO-IOLU RELAY INTERFACE

The ECHO-IOLU Relay Interface has a basic capacity of sixteen relay contacts with capability of connecting to additional units for a capacity of 256 contacts. Relay contact connections are brought out on plug-in screw terminal blocks. A serial RS-232 data port is used for communication with the Central Exchange in ASCII protocol. A plug-in cable is used for connection to additional ECHO-IOLU Interface units. The unit is housed in a metal surface mount enclosure and is furnished with a plug-in wall power supply.

Description of installer terminals for 4377 Relay Interface



3.5.7 ECHO-PBXI TELEPHONE INTERFACE

The ECHO-PBXI Telephone Interface allows stations to place or receive calls to outside telephones. The unit connects to any unused ECHO line extension on the ECHO Central Exchange and an analog PBX outside line. The ECHO Central Exchange can accept multiple ECHO-PBXI Telephone Interface

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units. The unit is equipped with a panel disconnect switch and LED indicators for Ring, Connect and Power. An RJ-11 jack is provided for connection to an analog line and a plug-in screw terminal for connection to the Line Card pair.

3.6 E-MDS ADMINISTRATIVE MASTER INSTALLATION

There can be a maximum of eight (8) Administrative Masters for each Digital Switch if Night Mode is enabled.

EQUIPMENT

The compact console unit is equipped with a handset as well as panel speaker and electret microphone. A standard 24 button keypad and LCD display with Two Lines of 16 characters each is provided. The unit is furnished in a light ash tone console with matching handset intended for indoor use in a desktop or wall mount application.

TECHNICAL DATA

Dimensions (WxDxH):

6.25 x 8 x 3 in. (16 x 20.3 x 7.6 cm)

Rated Input:

Voltage: 24Vdc nominal

Current:

Idle: .025A

Connected: .065A

Amplifier Output:

1.0W

Speaker:

Size: 2.5 in.

Impedance: 45 ohm

Microphone:

Type: electret

Sensitivity: -70dB

Keypad:

E-DSM: 24 buttons, Membrane Type

Termination:

RJ-11, Non Polar

Handset:

Electret Microphone

Receiver Element

3.7 SERIAL DATA PORT J11 APPLICATIONS

3.7.1 PC Programming of System

Connecting and Configuring a PC for program-

ming the exchange using ECHO-SFW Windows Programming Software. Refer to ECHO-SFW user manual.

3.7.2 Connecting and Configuring a Relay Interface (echo-iolu) or Video Display Terminal (VDT).

A VDT or ECHO-IOLU Relay Interface may be attached to the J11 port of either Mother Board in the exchange. The J11 port may be configured to provide an RS-232 ASCII output of exchange activity compatible with a Video Display Terminal (VDT) such as Wyse WY-30 or equal. Connect port J11 of the exchange to the VDT using a Male 25 to Male 9 cable. For ECHO-IOLU use a Male-Female DB-9 cable. Configure the VDT format: 19.2K Baud, 8 Data, Even Parity, 1- Stop Bit.

Initialize the J11 port for the VDT/ECHO-IOLU mode by typing at the attached VDT or Terminal Emulator: #<CR>

The Real Time Clock option ECHO-RTC must be installed for date/time stamping of each event. If the Real Time Clock Option is installed, the VDT must be connected to the J11 port on the Mother Board containing the ECHO-IOLU.

3.7.2.1 ASCII Protocol for Interface to CCTV Camera Control

vdt mode rs-232 protocol

RS-232 format = 19.2K baud, 8-data, even parity, 1-stop bit

PACKET FORMAT:

#<cr> SELECT VDT MODE

ssss:CALL #X PLACED (xxxxxxxxxxxx)

mm/dd/yy hh:mm:ss<CR><LF>

ssss-dddd RING mm/dd/yy

hh:mm:ss<CR><LF>

ssss-dddd CONNECT mm/dd/yy hh:mm:ss
<CR><LF>

ssss-dddd BUSY mm/dd/yy hh:mm:ss
<CR><LF>

ssss QUIT mm/dd/yy hh:mm:ss <CR><LF>

ssss DAY mm/dd/yy hh:mm:ss <CR><LF>

ssss NIGHT mm/dd/yy hh:mm:ss<CR><LF>

KEY TO ABBREVIATIONS:

ssss = Source Station Extension (2-4 digits)

dddd = Destination Station Extension (2-4 digits)

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(Admin mode only)

call #x = call type (x=0-9)

(xxxxxxxxxxx) = call text (11 Characters)

(Valid only if ECHO-RTC Real Time Clock
option installed)

mm = month (01-12)

dd = day (01-31)

yy = year (00-99)

hh = hours (00-23)

mm = minutes (00-59)

ss = seconds (00-59)

Part 4. Programming

4.0 PROGRAMMING

The Central Exchange has two modes of operation, the Run Mode and the Program Mode. The Run Mode is used to execute all signal and call operational features. The Program Mode is used to review or change the operating features of the exchange. The Program Mode is password protected. The Program Mode may be accessed from any Master station. Access to the Program Mode may be disabled for all stations by a switch setting in the Central Exchange. (Fig 3.9) There are two methods of programming a ECHO - PCX Series System:

4.0.1 Programming with a Master Station

For programming systems or for system maintenance, use a Master station to program all other stations connected to the same Mother Board (group of 48 stations).

4.0.2 Programming with a PC

It is also possible to program the system using a PC with Windows 95/98 running the ECHO-SFW Windows Program Software (APS). The APS allows local and global programming of all stations in the exchange from the PC. (Optional with ECHO - PCX)

4.1 PROGRAM PROTECTION

All programmable system data including customized user changes (system configuration) is retained in non-volatile solid-state memory devices and does not require reprogramming in the event of a primary power failure.

4.2 PROGRAM WORKSHEETS

To simplify on-site programming, Program Worksheets should be completed before attempting to program the exchange. Documenting wire pair color codes, station location and line card connection location is mandatory. Further information gathered from facility staff concerning system usage, directory names, will prove useful. Fig. 4.15. Photocopy Fig. 4.15 as required.

4.3 AUTO-ASSIGN PROGRAMMING

The exchange is now ready to be programmed. In order for stations to communi-

cate, and to perform system check-out, address extension numbers must be assigned to each station. As each station is attached to a station line it is automatically assigned an extension number (Default is two digits) . Only one station may be attached to a station line. There are three categories of stations which may be attached to a Series ECHO-MB

4.3.1 Master Stations

Stations which have a complete dialing keypad and an LCD display. Each Master station requires a non-zero address extension number.

4.3.2 Sub-stations

Stations which have a limited number of call buttons and no LCD. Each Sub-station requires:

- a. A non-zero address extension number
- b. A destination address extension or Admin Code number for each Call button on the station.
- c. The station type must be respecified as a Sub-station if All Master program option is selected.

4.3.3 Special Stations

Stations used as an interface between the Central Exchange and third party equipment such as P.A. Page or Program Music Distribution sources. Each Special station requires a special extension number. The station type must be respecified as "Specialty" if All Master program option is selected.

4.4 BASIC PROGRAMMING OPTIONS

This section describes quick-start programming options to auto-assign values to allow system checkout of basic operation (place and receive calls). The exchange has three built-in options for auto-assignment of basic required values.

4.4.1 All-Master Exchange

For an exchange with predominantly Master stations the exchange will auto-assign Standard extension numbers. All other station types will require manual programming to completely activate. This is the default option.

4.4.2 All Sub-Station Exchange

For an exchange with predominantly Sub-stations and no Administrative Masters, the

exchange can auto-assign Station Type as: "Sub-station with no cancel", address extension number and a fixed destination extension for a Standard call to 10 or first station. This would allow all Sub-stations to place Standard calls to one destination to facilitate system check-out. All other station types will require manual programming to completely activate.

Sub-stations with Cancel buttons will function but will time-out in the Call Abandonment time limit like Subs with no Cancel. To prevent the time-out, re-program Station Type to: "Sub-station with Cancel (button).

4.4.3 All Sub-Station Exchange With Admin Master

For an exchange with predominantly Sub-stations reporting to one or more Administrative Masters, the exchange can auto-assign Station Type as Sub-station with no cancel, address extension number and a fixed destination extension for an Admin call to 0410. This would allow all Sub-stations to place Admin calls to one Administrative Master connected to position 1 of Digital Switch 001 to facilitate system check-out. All other station types will require manual programming to completely activate.

4.5 BASIC PROGRAMMING PROCEDURE

4.5.1 All-Master Exchange

Two digit extension numbers are automatically assigned for each attached station. Refer to Table 4.14 for a cross reference of extension numbers to line cards. When the information in this table is matched with the Installer Worksheet data on station location it can be used to prepare an extension directory.

Master stations are now fully functional for placing/receiving calls using the auto-assigned extension numbers. Default values have been loaded for all features except extension Directory Names which may be added after system check-out is complete.

Systems with Sub stations, Administrative Masters or Special Stations will require additional programming.

4.5.2 All Sub-station Exchange.

No Administrative Masters.

1. Refer to Fig 3.9 and verify Program Mode dip-switch is enabled.
2. From an idle Master station, key "090" and when prompted enter the password: "1743". The station will now be in the V (global) section of the Program Mode.
3. Press either "V" key until the RESET MEMORY screen is displayed.
4. Press the "3" key to select S;
 - a. Extensions are assigned for all stations.
 - b. Station Type changed to: Sub-station with No Cancel Button.
 - c. Call Button #1 destination assigned extension: 10.

Two digit extension numbers are automatically assigned for each attached station. Refer to Table 4.14 for a cross reference of extension numbers to line cards. When the information in this table is matched with the Installer Worksheet data on station location it can be used to prepare an extension directory.

Sub-stations are now fully functional for placing/receiving calls using the auto-assigned extension numbers. Button #1 on all Sub-stations will call to station 10. Default values have been loaded for all features except extension Directory Names which may be added after system check-out is complete.

Systems with Master stations, Administrative Masters or Special Stations will require additional programming. Master stations will speed dial to station 10 when digit 1 is pressed until their Station Type has been reprogrammed from Sub to Master.

It is recommended that a Master station be connected to station location 1 (extension 10) on the line card for Sub-station checkout.

4.5.3 All Sub-Station Exchange with Administrative Master

1. Refer to Fig 3.9 and verify Program Mode dip-switch is enabled.
2. From an idle Master station, key "090" and when prompted enter the password: "1743". The station will now be in the V (global) section of the Program Mode.

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3. Press either "V" key until the RESET MEMORY screen is displayed.
4. Press the "4" key to select A;
 - a. Extension assignment for all stations.
 - b. Station Type changed to:
Sub-station with No Cancel Button.
 - c. Call Button #1 destination assigned extension: 0410.
 - d. Line Card location #1 is configured as
Master #1

Two digit extension numbers are automatically assigned for each attached station. Refer to Table 4.14 for a cross reference of extension numbers to line cards. When the information in this table is matched with the Installer Worksheet data on station location it can be used to prepare an extension directory.

Sub-stations are now fully functional for placing/receiving calls using the auto-assigned extension numbers. Button #1 on all Sub-stations will place an Admin call to Administrative Master 1. Default values have been loaded for all features except extension Directory Names which may be added after system check-out is complete.

Systems with Standard Master stations, or Special Stations will require additional programming. Master stations will speed dial to Administrative Master 1 when digit 1 is pressed, until their Station Type has been reprogrammed from Sub to Master.

It is recommended that a E-MDS Administrative Master station be connected to station location 1 (extension 10) on the line card for Sub-station checkout.

4.6 MANUAL PROGRAMMING

This section describes the method to manually program feature values for each station.

4.6.1 Connecting a Master Station for Programming

Connect a Master station to any unused pair on the line card. Global (V) programming for the entire exchange may be completed from this node as well as Local (D) programming

for the stations connected to the Digital Switch. Follow the step-by-step procedures in Sec. 4.7, Manual Programming with a Master Station. Note: Only one station may be connected to a line pair.

4.7 MANUAL PROGRAMMING WITH A MASTER STATION

Refer to Fig 3.9 and verify Program Mode dip-switch is enabled. From an idle Master station, key "090" and when prompted enter the password: "1743". The station will now be in the V (global) section of the Program Mode.

4.7.1 V Section Description

The V Section (global, each change affects all stations simultaneously in the entire exchange). The V Section is used to change or review global options for the entire exchange such as time limits.

4.7.2 D Section Description

The D Section (local, changes affect only a single extension). The D Section is used to change or review options on individual stations one at a time such as Name Directory or Group Call assignments.

To change to the D Section from the V Section, press either "D" key. To change back to the V Section press either "V" key.

To EXIT at any time press the "X" key. With no keyboard activity, the station will timeout and exit the program mode after one hour.

4.8 PROGRAM MODE KEYPRESS SUMMARY

"090" Access Program Mode

"1743" Password

"X" Exit Program Mode

V Section Program Mode

"V" +/- Select next menu option
(also can use T key)

"D" arrow up/dn Change from V to D
Section of Program Mode

D Section Program Mode

"D" arrow up/dn Select next station
number for review
or change

"T" Select next menu option
Any number key "0-9" . Move between
choices in menu options

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"V" + or - Change from D to V
Section of
Program Mode

4.9 Using the Program V Section

The V Section (global) lists options which affect all stations in the system.

4.9.1 Select the Next V Menu Option

Use the "V" keys to review or change menu options within the V section (can also use "T" key).

4.9.2 V Default Settings

Default values are shown at the end of each line item below. The LCD screen will display the default or current value set for that option.

4.9.3 "V" Section Program Screens

1. VER. = U430: Y.Y.Y

C = AA P = BB

SOFTWARE VERSION, ACTIVE
STATION COUNT

Display of software version of Digital
Switch to which the station is connected.
Also shows number of connected and number of programmed stations.
U430 = system type; YYY version number.
C = # of connected stations.
P = # of programmed stations.
No entries to be made in this screen.

2. PREANNOUNCE TONE

(0 = OFF; 1= ON) Default = 1

Two short tones heard at stations upon connection.

3. PAGE TIME LIMIT

(0, 1-99 SEC) 0 = no limit Default = 10

Limits the time that a station may Group Call, All-Call, P.A. Page, and Em All Call.

4. RING TIME LIMIT

(0, 1-99 SEC) 0 = no limit Default = 25

Limits the time that a station in Full Privacy will ring.

5. ANSWER BACK TIME limit

(0, 1-10 MIN) 0 = no limit Default = 2

Limits time to reply back after All-Call or Group-Call.

6. MESSAGE REMINDER tone

(0, 1-10 MIN) 0 = disable Default=1

Limits time interval between double beep message tones.

7. RESET MEMORY

(1Y,2E,3S, 4A) = X Default = 0

0 = Default; No changes will be made to current configuration.

1 = YES; Changes will be made to current config. after a 4 second delay causing a bulk erase of ALL changes including all extension #s, directory names and values for V and D sections.

ARE YOU SURE?

2 = E; All Master Station System

a. 2 Digit extensions.

b. Station type changed to Master.

3 = S; All Sub-Station Exchange, No Admin Masters

a. Auto-assign extension numbers for all stations.

b. Station Type changed to Sub-station w/no cancel.

c. Call button #1 destination is:

10,101 or 1001.

Line Card Station location 1
is configured as a Master.

4 = A; All Sub-Station Exchange, with Admin Masters

a. Auto-assign extension numbers for all stations.

b. Station Type changed to Sub-station w/no cancel.

c. Call Button #1 destination = 0410

d. Line Card Station location 1
is configured as Admin Master #1.

X = Current choice. Current choice will return to 0 when returning to this menu screen.

8. POCKET PAGE MODE

(0-2) Default = 0

Requires ECHO-PPS Radio Page Interface Station (max 1).

9. EMERGENCY ALL-CALL PASSWORD

(0=OFF, 10-99) Default=0

Emergency All-call pre-empts all connections.
0 = no password required;
Password = any 2 digits 10 to 99.

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10. **EXTENSION DIGITS** Default = 2
(2-4) = X
2 digit [10-99], 3 digit [101-249], 4 digit [1001-1149]. Select the number of extension digits for all stations. Individual station extension numbers are not programmable and are determined by line card location within the specified ranges. Refer to Table in Sec. 4.12.7 for a cross reference of extension numbers to line cards. If 2 digit extensions are selected the maximum number of Master and Sub- Stations that may be connected is reduced from 96 to 90. Line Card locations 91-96 do not have dialable extensions in 2 digit mode. Line Card locations 91-96 may still be utilized for connection of special stations.
11. **CALL ABANDONMENT timer** Default = 3
(0, 1-99 MIN) = X
0 = Off, 1-99 = Number of minutes before Sub-stations with no cancel button will time out and be reset to idle.
12. **NO ANS CALL FWD timer** Default = 12
(0, 1-99 SEC) = X
0 = Off, 1-99 = Number of seconds before a No Answer Call Forwarded call will be forwarded from its original destination. This time must be less than Item 4., Ring Time Limit.
13. **ADMIN NIGHT MODE** Default = 0
(0=OFF, 1=ON)
For Administrative Masters only. Disable if more than 8 Adm. Mstrs. must be attached to a Digital Switch.
NOTE: Skip Steps 14-18 Unless 4630 REAL TIME CLOCK option is installed
14. **SET CLOCK MONTH**
(1-12) Default = 0
15. **SET CLOCK DAY**
(1-31) Default = 0
16. **SET CLOCK YEAR**
(0-3999) Default = 0
17. **SET CLOCK HOUR**
(0-23) Default = 0

18. **SET CLOCK MINUTE**
(0-59) Default = 0

NOTE: Skip Steps 19-21 Unless ECHO-PBXI TELEPHONE INTERFACE is installed. Refer to section 4.12

19. **PHONE ACCESS OUT**
XXXX Default = 0

20. **INBOUND EXT.**
XXXX Default = 0

21. **AUTO DIAL PHONE #**
Default = Blank
* Use 2 digit translation table 'B' at end of section

22. **DIGITAL SWITCH COUNT**
Count (X) = Y
(X) = connected, Y = programmed
Shows number of Mother Boards connected.
(1 or 2) No entry to be made in this screen.

4.10 The Program D Section (Local)

This section of the Program mode is used to individually program all stations connected to station lines. There are four categories of station:

1. Master Stations
2. Sub-stations
3. Administrative Masters
4. Special Stations

Each category requires a different set of entries.

The D Section lists Options which affect only the station whose extension is currently displayed on the program station's LCD screen. Some Options have multiple Choices. The LCD screen of the program station displays the extension of the station being programmed.

4.10.1 Select the Next D Section Menu Option

Press "T" to select next menu Option, within the D Section, sequentially for each station in the connected 48 stations. Pressing "T" after the last menu Option for a station will display menu Options for the next station.

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4.10.2 Selecting the Next Choice in an Option

To toggle between multiple Choices in an Option, press any Number key 0-9.

4.10.3 Selecting the Next Extension

Press the "D" up/down arrow keys to select the previous/next station in sequence.

4.10.4 D Section Default Settings

All Options have default settings which are displayed on the option Choice line of the LCD. In the following text, the numeral ="X" after each Option line represents the default or current value for each Numeric Option. The default value for Word Options are in UPPER CASE. The characters "XXXX" denotes the extension number for up to 48 Stations connected to the same Digital Switch. For multi-switch systems, use a station connected to the other node(s) (Digital Switch) or for centralized programming use ECHO-SFW Administration Program Software (APS).

4.11 'D' Section Program Screens

Skip # 1 if programming a Master Station or Sub-Station.

1. NNN-PN: EXTENSION XXXX

NNN= Digital Switch Number (NODE)
Used to identify which Digital Switch a station is associated with.

PN= Station Pair Number
Used to identify the Line Card to which a station pair is connected. Refer to Table 4.14 for a cross reference of Node-Pair numbers to extension numbers and line cards.

All Master and Sub-Stations are automatically assigned an extension number. Master and Sub- Stations may be de-assigned by entering extension 0. Special stations must be assigned an extension according to the table in section 4.11.1.

Skip # 2 if programming a Special Station.

2. XXXX: NAME

Directory name information to be programmed for each call station in the sys-

tem. Displays on caller and called station LCD. Enter up to 16 characters by keying 2 digit pairs from Conversion Table A using the program worksheet to record the conversions. Press "T" after the last character entry.

3. XXXX: STA. TYPE

(MASTER; specialty; sub w/cancel;
sub no cancel)
Defines the attached station type.

Skip # 4 if programming a Special Station (except PA Page).

4. XXXX: SOUND VOL

(0 = Low; 9 = High;) Default = 2

To change the station voice volume setting from default value. Sound volume can also be changed at each Master station with volume keys.

Skip # 5 if programming a Special Station.

5. XXXX: RING VOL

(0 = Low; 9 = High;) Default = 2

To change the Full Privacy Ring volume from the default or current value. Ring volume can be changed at each Master station with volume keys during ring cycle.

Skip # 6 if programming a Special Station.

6. XXXX: PRIVACY lock (fixed; CHANGEABLE)

FIXED = Master station may not change the value preset for station privacy.

CHANGEABLE = Master Station may change privacy value.

Skip # 7 if programming a Special Station

7. XXXX: PRIVACY status (NON-PRIVATE; semi-private; full private; do not disturb)

A Non-Private and a Semi-Private station both receive a preannounce tone and are automatically connected when called. A Semi-Private station's microphone is muted for privacy until answered by keying "T" or going off-hook. A Full Privacy station receives an interrupted ring

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and connects when answered by keying "T" or going off-hook. A station in DND appears busy to calling stations.

Skip # 8 if programming a Special Station.

8. XXXX: EMER ALL CALL

(enable; DISABLE)

ENABLE = Emergency All-call enabled for this station with use of global password.

DISABLED = Emergency all-call disabled for this station.

Skip # 9 if programming a Special Station (except PA Page).

9. XXXX: GROUP #

(0 = OFF; 1-9) = Default = 0

Each call station can be a member of any one of nine groups 1 to 9 or a member of none (OFF). Specify group number.

Skip # 10 if programming a Special Station (except PA Page).

10. XXXX: ALL CALL

(Disabled; Place Only; RECEIVE ONLY; Place & Receive)

DISABLED = This station cannot place or receive all-calls.

PLACE ONLY = This station can place all-calls.

RECEIVE ONLY = This station can receive all-calls.

PLACE & RECEIVE = This station can place and receive all-calls.

Skip # 11 if programming a Master Station or Special Station.

Sub-Station Button Destination Programming

Sub-stations can be programmed to place two types of calls, Standard and Admin. Station with multiple call buttons may mix or match call types.

Sub-station buttons programmed as Standard place calls to Masters or Sub-stations.

To specify a Standard call destination for Button # 1-4, enter a conventional extension:

10-99,
101-249 or 1001- 1149. No leading zeros.
For programming Admin calls see Sec. 4.11.2.

11. XXXX: BUTTON #1 sub-station calls # (Ext/Call=YYYY) Default = 0

Specify the extension to be called for the top button on Sub-stations.

OFF = Button #1 disabled.

YYYY = Extension of any call station.

Skip # 12 if programming a Master Station or Special Station.

12. XXXX: BUTTON #2 sub-station calls # (Ext/Call) = (0=Off; YYYY) Default = 0

Specify the extension to be called for 2nd button on Sub-stations.

OFF = Button #2 disabled.

YYYY= Extension of any call station.

Skip # 13 if programming a Master Station or Special Station.

13. XXXX: BUTTON #3 sub-station calls (Ext/Call) = (0=OFF; YYYY) Default= 0

Specify the extension to be called for 3rd button on Sub-stations.

OFF = Button #3 disabled.

YYYY = Extension of any call station.

Skip # 14 if programming a Master Station or Special Station.

14. XXXX: BUTTON #4 sub-station calls (Ext/Call) = (0=OFF; YYYY) Default= 0

Specify the extension to be called for the button (#4) on Sub-stations.

OFF = Button #4 disabled.

YYYY = Extension of any call station.

15. XXXX: PARTITION

(0, 1-99) Default = 1

Specify the partition in the exchange that this station will have access to. Stations in different partitions cannot communicate with each other. 0 = All partitions; use for attendant station. A Standard station in partition 0 can call to any partition. A sub-station in Admin mode in partition 0 reports to all admin masters.

Skip # 16 if programming a Special Station.

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16. **XXXX: PRE-EMPT break-in**

(INBOUND ONLY; outbound only;
in & outbound; disabled)

INBOUND ONLY = This station can be pre-empted.

OUTBOUND ONLY = This station can pre-empt stations set for Inbound.

IN & OUTBOUND = This station can be pre-empted and can pre-empt stations set for Inbound.

DISABLED = This station cannot pre-empt or be pre-empted.

Skip # 17 for all stations except E-MDS Administrative Masters.

17. **XXXX: ADMIN OWN**

DAY/NIGHT = Default = 0

0-9 = Ownership of substations in Admin call mode.

0 = Off; 1-8 = Administrative Master address; Will receive Admin calls from all substations with matching address in same partition ; 9 = Receives Admin type calls from all substations in partition.

There can be a maximum of eight (8) Admin Masters connected to each Digital Switch if Night Mode is enabled.

Day/ Night; Always enter two digits for ZZ even if D/N ownership is the same. If there is no night ownership enter Z0 where Z is the day ownership, conversely, if there is no day ownership, enter 0Z.

If Night ownership for Admin Master is different than Day enter the 2nd different address value. Night ownership includes day ownership.

Skip 18-25 if programming a Sub or Special station.

2 DIGIT SPEED DIAL

18. **XXXX : SPD. BIN 01**

(ext)=0

19. **XXXX : SPD. BIN 02**

(ext)=0

20. **XXXX : SPD. BIN 03**

(ext)=0

21. **XXXX : SPD. BIN 04**

(ext)=0

22. **XXXX : SPD. BIN 05**

(ext)=0

23. **XXXX : SPD. BIN 06**

(ext)=0

24. **XXXX : SPD. BIN 07**

(ext)=0

25. **XXX : SPD. BIN 08**

(ext)=0

TABLE A. CONVERSION TABLE FOR DIRECTORY TEXT

Example of directory text entry using Conversion Table A:

Mr. Jones 45 82 14 00 42 79 78 69 83
PHARMACY 48 40 33 50 45 33 35 57

00-space	16-0	32-@	48-P	64	80- p
01-!	17-1	33-A	49-Q	65-a	81-q
02-"	18-2	34-B	50-R	66-b	82-r
03-#	19-3	35-C	51-S	67-c	83-s
04-\$	20-4	36-D	52-T	68-d	84-t
05-%	21-5	37-E	53-U	69-e	85-u
06-&	22-6	38-F	54-V	70-f	86-v
07-,	23-7	39-G	55-W	71-g	87-w
08-(	24-8	40-H	56-X	72-h	88-x
09-)	25-9	41-I	57-Y	73-i	89-y
10-*	26-:	42-J	58-Z	74-j	90-z
11-+	27-;	43-K	75-k		
12-'	28-<	44-L	76-l		
13--	29-=	45-M	77-m		
14-.	30->	46-N	78-n		
15-/	31-?	47-O	79-o	00-SPACE	
	96-CLEAR LINE			99-BACKSPACE	

4.11.1 Special Station Program Extensions

<u>Cat.#</u>	<u>Type</u>	<u>Extension</u>
ECHO-PAI	P.A. Page	0100 to 0109 10 Per (P.A. Page PartitionZones 0-9)
ECHO-BGM	Bg music	0200 to 0209 Global, 10 (Program Per Exchange Channels 0-9)
ECHO-PPI	Pocket page	03
ECHO-PBXI	PBX Inter.	0500 to 0599
ECHO-2URI	2-Way Radio	0600 to 0609 Global, 10 2-Way channel Per exchange 0-9

Note: Special Station extensions are non-dialable by Master stations.

4.11.2 Sub-station Buttons Programmed for Admin Calls (used only if Sub-stations report to Administrative Master).

A Sub-station button programmed as Admin places calls to Administrative Masters. Admin Call button destination extensions must be programmed with four (4) digits regardless of the specification for the number of conventional extension digits for other stations. Note: Admin destination extensions are non-dialable by Master stations.

4.11.2.1 Digits 1 and 2 of a Sub-station with Admin Extension

A Sub-station button (#1, 2, 3 or 4) programmed to place an Admin type call must have a destination extension containing leading digits of "04" which defines an Admin call.

4.11.2.2 Digit 3

The 3rd digit in the Call button address represents the address digit of a Cat. 4365 Administrative Master that is to be called.

Digit 3 Function

"0"; OFF. This button will not place calls.

"1-8"; Specifies the address of an Administrative Master in the same partition to which calls will be placed.

"9"; Specifies that the Sub-station button will call all Administrative Masters in the same partition.

4.11.2.3 Digit 4

The 4th digit in the address represents the call type to display at the Administrative master for this Call button.

<u>Digit 4</u>	<u>Function</u>	<u>Call Message</u>	<u>Status</u>
"0"	Non-locking	Routine	Routine
"1"	Locking	Normal	"
"2"	Non-locking	Urgent	"
"3"	Locking	Auxiliary	"
"4"	Non-locking	Alarm	Routine
"5"	Locking	Alarm	Emergency
"6"	Non-locking	Emergency	"
"7"	Locking	Code	"
"8"	Non-locking	Emergency 8	"
"9"	Locking	Emergency 9	Emergency

Sub-station buttons programmed to place Admin calls are capable of being programmed to place either Routine or Emergency status calls with selectable Locking or Non-locking status.

A Locking call must be reset at the calling station. Do not use for Sub-stations with no Cancel button. A Non-locking call may be reset from the Administrative Master.

Admin calls are capable of being assigned any of ten pre-programmed text messages and are capable of reporting to multiple masters.

Example: 0430

04 = admin type call

3 = address of admin master which receives call

0 = Type of call which is displayed at admin master

("ROUTINE", NON-LOCKING)

4.12 PROGRAMMING ECHO-PBXI

Telephone Interface Operation Modes and Programming

4.12.1 INBOUND #1

OUTSIDE PHONE CALLS TO ANY EXTENSION

When ECHO-PBXI Interface Receives a call from an outside phone it connects and the outside phone receives the internal dial tone. The DTMF outside phone may now key in the extension of any ECHO station. The non-busy station will be placed in the full privacy mode and will ring. The calling party receives ring-back tone. The station may answer the call in the usual manner.

4.12.1.1 "INBOUND #1" PROGRAMMING:

1. "V" Mode "INBOUND EXTENSION" (screen 20) enter digit "1"

INBOUND EXT.

XXXX

Default=0

2. "D" Mode for ECHO-PBXI Interface line according to TABLE C

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4.12.2 INBOUND #2

OUTSIDE PHONE CALLS TO A PRESET EXTENSION

When ECHO-PBXI Interface receives a call from an outside phone it connects. A pre-programmed non-busy ECHO station will automatically be placed in full privacy mode and will ring. The calling party receives ringback tone. The station may answer call in the usual manner.

4.12.2.1 "INBOUND #2" PROGRAMMING:

1. "V" Mode "INBOUND EXTENSION" (screen 20) enter ECHO station extension # to ring when called from outside.

INBOUND EXT.

XXXX

Default=0

2. "D" Mode for ECHO-PBXI Interface line according to Table C.

In either INBOUND mode, after connection to a Substation, the outside phone caller may activate a relay contact on the Substation by depressing the #4 key on the outside phone. Enabling of "OUTBOUND Modes with either "INBOUND" Mode is allowed.

4.12.3 OUTBOUND #1

MASTER STATION CALLS to OUTSIDE PHONE

A Master Station may dial an installer specified extension number to access an outside line. Master Station receives outside dial tone and may use keypad to dial an outside phone number.

0-9 numeric keys, "T" key = "*", "D" down arrow key = "#", X = disconnect.

When multiple ECHO-PBXI Interfaces are installed they become part of a hunt group. When a Master dials the access extension for an outside line it will be assigned the first available ECHO-PBXI Interface in the hunt group.

4.12.3.1 "OUTBOUND #1" PROGRAMMING:

1. "V" Mode "PHONE ACCESS OUT" (screen 19) enter ECHO station extension # to be dialed for access to outside line.

PHONE ACCESS OUT

XXXX

Default=0

"XXXX" Must be 2, 3, or 4 digits to agree with

"EXTENSION DIGITS" specified in 4.9.3 screen #10

2. "D" Mode for 4362 Interface line according to Table C.

4.12.3.2 DIAL "9" FOR OUTSIDE LINE ON MASTER STATION

When ECHO-PBXI Interface is installed, Master stations may be programmed for single button "9" access to an outside line by programming the Master station for "Single Digit Speed Dial" to call the access extension of the ECHO-PBXI Interface station.

Programming Procedure:

1. Program Cat. ECHO-PBXI for "Outbound Mode #1" per section 4.12.3.1 by assigning an extension in the "V" program mode.
2. For each Master requiring "9" single digit access enter "D" mode for those Masters. Go to Button #4 field. Enter the "Phone Access Out" extension #.

When "9" is depressed the Master station will receive outside dial tone. Note that digit "9" is no longer available for use as the leading digit of extensions.

4.12.4 OUTBOUND #2

SUBSTATION AUTO-DIALS to OUTSIDE PHONE

A. Direct Auto-Dial

Substations may Auto-Dial a single pre-programmed outside DTMF phone number when a call button is pressed. Calls from substations with no cancel button will time-out when the setting for the Call Abandonment timer is exceeded.

4.12.4.1 "OUTBOUND #2" PROGRAMMING:

1. "V" Mode "AUTO-DIAL" (screen 21) enter outside phone number up to 16 digits using Two Digit Conversion Table B. (Sec. 4.12.6) for all characters.

AUTO DIAL PHONE #

Default=Blank

2. "V" Mode "PHONE ACCESS OUT" (screen 19) specify any unused valid station extension # to be dialed for access to outside line.

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3. "D" Mode for ECHO-PBXI Interface line according to Table C.

4. "D" Mode for Substation "BUTTON #1" enter extension # for Phone Access Out

4.12.5 "NO ANSWER CALL FORWARD" to ECHO-PBXI Interface.

Calls from Substations to an unstaffed Master station may be "Call Forwarded" to an outside phone via Auto-Dial

A Substation is programmed to call a Master station programmed for "NO ANSWER CALL FORWARD" to the ECHO-PBXI Telephone Interface. When the call is unanswered at the Master station the ECHO-PBXI (which is programmed for OUTBOUND #2) will Auto-Dial the outside phone number.

4.12.5.1 "OUTBOUND #2" with "NO ANSWER CALL FORWARD" PROGRAMMING

1. "V" MODE "AUTO-DIAL" (screen 21) enter outside phone number up to 16 digits using Two Digit Conversion Table B. (sec. 4.12.6) for all characters.

AUTO DIAL PHONE #

Default=Blank

2. "D" Mode for Interface line according to Table C.

3. "D" Mode for Master Station; "SPEED DIAL BIN 08" (screen 25) enter: "Phone Access Out" extension. Refer to Install Manual "V" Mode for "No Answer Call Forward" timer settings.

XXX : SPD BIN 08

(ext)=0

4. "D" Mode for Substation "BUTTON #1": enter extension of Master station.

4.12.6 Table B CONVERSION TABLE FOR ECHO-PBXI AUTO-DIAL #

Examples of ECHO-PBXI Auto-Dial # using conversion table B:

Number to be programmed 17732751900
Conversion 17 23 23 19 18 23 21 17 25 16 16

Number to be programmed 2751900 (pause) (pause) 101
Conversion 18 23 21 17 25 16 16 48 48 17 16 17

16-0 17-1 18-2 19-3 20-4 21-5 22-6 23-7
24-8 25-9 38-HOOK FLASH
48-PAUSE(1SEC) 96-CLEAR 99-BACK

4.12.7 Table C

"D" MODE Programming for each ECHO-PBXI Interface. Required for all INBOUND and OUTBOUND Modes.

Screen #1 "EXTENSION" enter "0500" for first ECHO-PBXI, "0501" for second, etc.
..."0599"

NNN-PP: EXTENSION XXXX

NNN-PPP = Node-Pair Number

Screen #2 "NAME" enter identity such as:
"PBX 1"

XXXX: NAME

Screen #3 "STATION TYPE" select
"SPECIALITY"

XXXX: STA. TYPE

(Speciality)

Screen #6 "PRIVACY" select "FIXED"

XXXX: PRIVACY lock

(fixed; changeable)

Screen #7 "PRIVACY" select "NON-PRIVATE"

XXXX: PRIVACY status

(NON-PRIVATE; semi-private;
full private; do not disturb)

Screen #15 "PARTITION" enter same partition number as stations to be accessed by inbound calls.

XXXX: PARTITION

(0,1-99)

Default=1

Screen #16 "PRE-EMPT" select "DISABLED"

XXXX: PRE-EMPT break-in

(INBOUND ONLY; outbound only;
in & outbound; disabled)

**4.13 Cat. E-MDS Administrative Master
Programmable Keys**

The station is equipped with seven programmable keys that may be used to duplicate, with one key press, a sequence of up to 16 key presses entered on the 0-9, T or X keys to invoke a feature such as an auto-conference or other multi-key sequence.

1. Enter the Key Program Mode:
 - a. Press and hold the Tone Silence key until the LCD display reads "PROGRAM MODE" (approx. 2 seconds).
 - b. Release Tone Silence key.
2. Program a Sequence:

While in the key program mode, press 0-9, T or X keys in any order to record a sequence of up to 16 key presses.
3. Assign the Sequence to a Programmable Key:

When finished entering the sequence, press the corresponding Programmable key to which the sequence is to be assigned.

To remove a sequence (deprogram a key), enter the Key Program Mode (step 1) and press the Programmable key to be deprogrammed.

Pressing the Tone Silence button while in the Program mode will exit the Program Mode without making any changes.

While in the Program Mode, display of call activity, except for LED's is suspended. After exiting the Program Mode the call display will update for any activity while in the Program Mode.

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Table 4.14 Extension Assignment Table 2, 3, and 4 Digits

Main Exchange
ECHO-MB#1

Slave Exchange
ECHO-MB # 2

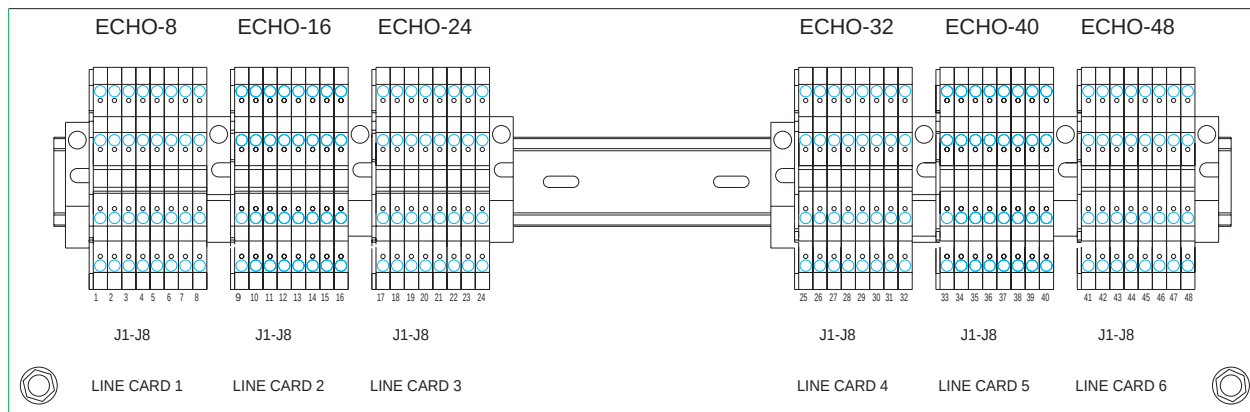
<u>Sta.</u>	<u>Extension</u>			<u>Node-Pair</u>	<u>Sta.</u>	<u>Extension</u>			<u>Node-Pair</u>	<u>Line Card</u>
1	10	101	1001	001-01	49	58	201	1101	002-01	J1
2	11	102	1002	001-02	50	59	202	1102	002-02	
3	12	103	1003	001-03	51	60	203	1103	002-03	
4	13	104	1004	001-04	52	61	204	1104	002-04	
5	14	105	1005	001-05	53	62	205	1105	002-05	
6	15	106	1006	001-06	54	63	206	1106	002-06	
7	16	107	1007	001-07	55	64	207	1107	002-07	
8	17	108	1008	001-08	56	65	208	1108	002-08	
9	18	109	1009	001-09	57	66	209	1109	002-09	J2
10	19	110	1010	001-10	58	67	210	1110	002-10	
11	20	111	1011	001-11	59	68	211	1111	002-11	
12	21	112	1012	001-12	60	69	212	1112	002-12	
13	22	113	1013	001-13	61	70	213	1113	002-13	
14	23	114	1014	001-14	62	71	214	1114	002-14	
15	24	115	1015	001-15	63	72	215	1115	002-15	
16	25	116	1016	001-16	64	73	216	1116	002-16	
17	26	117	1017	001-17	65	74	217	1117	002-17	J3
18	27	118	1018	001-18	66	75	218	1118	002-18	
19	28	119	1019	001-19	67	76	219	1119	002-19	
20	29	120	1020	001-20	68	77	220	1120	002-20	
21	30	121	1021	001-21	69	78	221	1121	002-21	
22	31	122	1022	001-22	70	79	222	1122	002-22	
23	32	123	1023	001-23	71	80	223	1123	002-23	
24	33	124	1024	001-24	72	81	224	1124	002-24	
25	34	126	1026	001-26	73	82	226	1126	002-26	J4
26	35	127	1027	001-27	74	83	227	1127	002-27	
27	36	128	1028	001-28	75	84	228	1128	002-28	
28	37	129	1029	001-29	76	85	229	1129	002-29	
29	38	130	1030	001-30	77	86	230	1130	002-30	
30	39	131	1031	001-31	78	87	231	1131	002-31	
31	40	132	1032	001-32	79	88	232	1132	002-32	
32	41	133	1033	001-33	80	89	233	1133	002-33	
33	42	134	1034	001-34	81	90	234	1134	002-34	J5
34	43	135	1035	001-35	82	91	235	1135	002-35	
35	44	136	1036	001-36	83	92	236	1136	002-36	
36	45	137	1037	001-37	84	93	237	1137	002-37	
37	46	138	1038	001-38	85	94	238	1138	002-38	
38	47	139	1039	001-39	86	95	239	1139	002-39	
39	48	140	1040	001-40	87	96	240	1140	002-40	
40	49	141	1041	001-41	88	97	241	1141	002-41	
41	50	142	1042	001-42	89	98	242	1142	002-42	J6
42	51	143	1043	001-43	90	99	243	1143	002-43	
43	52	144	1044	001-44	91	*	244	1144	002-44	
44	53	145	1045	001-45	92	*	245	1145	002-45	
45	54	146	1046	001-46	93	*	246	1146	002-46	
46	55	147	1047	001-47	94	*	247	1147	002-47	
47	56	148	1048	001-48	95	*	248	1148	002-48	
48	57	149	1049	001-49	96	*	249	1149	002-49	

*** Refer to Section 4.9.3.10**

PAIR COLOR		EXTENSION #	DIRECTORY NAME 16 CHARACTERS USE TABLE 'A'	DEFAULT VALUE
				MSTR
				4
				3
				0
				0
				0
				0
				0
				RCV
			SUB BUTTON #1	0
			SUB BUTTON #2	0
			SUB BUTTON #3	0
			SUB BUTTON #4	0
			PARTITION	1
			IN	IN
			OUT/REAR	0=OFF
			SPD EN 01	0
			SPD EN 02	0
			SPD EN 03	0
			SPD EN 04	0
			SPD EN 05	0
			SPD EN 06	0
			SPD EN 07	0
			SPD EN 08 / N.A.C.F.	0

COPY THIS PAGE AS NEEDED

Figure 4.15



ECHO-8		ECHO-16		ECHO-24		ECHO-32		ECHO-40		ECHO-48	
LINE CARD 1 J1-J8		LINE CARD 2 J1-J8		LINE CARD 3 J1-J8		LINE CARD 4 J1-J8		LINE CARD 5 J1-J8		LINE CARD 6 J1-J8	
1	MODEL EXT LOCATION	9	MODEL EXT LOCATION	17	MODEL EXT LOCATION	25	MODEL EXT LOCATION	33	MODEL EXT LOCATION	41	MODEL EXT LOCATION
2	MODEL EXT LOCATION	10	MODEL EXT LOCATION	18	MODEL EXT LOCATION	26	MODEL EXT LOCATION	34	MODEL EXT LOCATION	42	MODEL EXT LOCATION
3	MODEL EXT LOCATION	11	MODEL EXT LOCATION	19	MODEL EXT LOCATION	27	MODEL EXT LOCATION	35	MODEL EXT LOCATION	43	MODEL EXT LOCATION
4	MODEL EXT LOCATION	12	MODEL EXT LOCATION	20	MODEL EXT LOCATION	28	MODEL EXT LOCATION	36	MODEL EXT LOCATION	44	MODEL EXT LOCATION
5	MODEL EXT LOCATION	13	MODEL EXT LOCATION	21	MODEL EXT LOCATION	29	MODEL EXT LOCATION	37	MODEL EXT LOCATION	45	MODEL EXT LOCATION
6	MODEL EXT LOCATION	14	MODEL EXT LOCATION	22	MODEL EXT LOCATION	30	MODEL EXT LOCATION	38	MODEL EXT LOCATION	46	MODEL EXT LOCATION
7	MODEL EXT LOCATION	15	MODEL EXT LOCATION	23	MODEL EXT LOCATION	31	MODEL EXT LOCATION	39	MODEL EXT LOCATION	47	MODEL EXT LOCATION
8	MODEL EXT LOCATION	16	MODEL EXT LOCATION	24	MODEL EXT LOCATION	32	MODEL EXT LOCATION	40	MODEL EXT LOCATION	48	MODEL EXT LOCATION

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Program Section V Worksheets

FUNCTION	DEFAULT CURRENT VALUE SETTING
1. Software Version and Current value displayed	No entry required
2. Preannounce Tone	1 = ON
3. Page Time Limit	10 Seconds
4. Ring Time Limit	25 Seconds
5. Answer Back Time Limit	2 Minutes
6. Message Reminder Tone Interval	1 Minute
7. Reset Memory	0 = NO
8. Pocket Page Mode	0 = Automatic
9. Emergency All-Call Password	0 = None needed
10. Extension Digits	2
11. Call Abandonment Timer	Subs W/O Cancel Button 1 Minute
12. No Answer Call Forward Timer	12 Seconds
13. Admin Night Mode	0 = OFF
14-18 Set Clock, Month, Day, Year, Hour, Minute (OPTIONAL)	0
19. Outbound CO ext	
20. Inbound CO ext	
21. Auto CO Dial #	
22. Digital Switch Count	No Entry Required

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4.17 ECHO-PCX Install Manual Sample Worksheet Tutorial

White/Blue wire pair color. Assigned Extension #10, Directory Name Programmed to display "MR. JONES". Master station assigned to receive Group Calls for group #1. The station is in the default Partition "1" and can only call or receive calls from stations in this Partition. The remaining Master station features are factory default.

Extension 11; "DR. ALLAN", Master station assigned to receive Group Calls for group #1. All other features are default.

Extension 12; "SECURITY" Master station, Emergency All Call ENABLED, Group Call #1, All Call PLACE ONLY enabled. All other features are default.

Extension 13; "GATE 7", Substation without Cancel Button programmed to call extension #12. Presence or absence of Cancel button determines whether Call Abandonment timer will automatically terminate call. All other Substation features are factory default.

Extension 14; "GATE 8", same as gate 7

Extension 0100; Classified as a Special Station. P.A. Page Stations require a non-dialable extension # (010x). A Name directory entry is not required. All Master stations in the same partition can access this station. All other features should be left as default.

Extension 16; "RECEIVING DOCK", Substation with Cancel button programmed to call extension #12 from Button #1 and extension #17 from Button #2.

Extension 17; "ADMINISTRATION", Master station set for Full Privacy, Group Call #1, All Call PLACE ONLY enabled.

Extension 0200; Special Station. Program Music stations require a non-dialable extension # (020x). Name directory entry not required. All Master stations in the system can access this station. All other features left as default.

Extension 19; "GUARD 1" Master station (Administrative Master) set for Full Privacy. This Master is programmed for Partition 2. This station can only call and receive calls from other stations in Partition 2. This station is capable of receiving both Standard and Admin calls. Multiple Admin calls are placed in a call list and may be answered in any order. The Admin Call "Day" address of this Master is "1", the "Night" address is "0" or disabled. Two digits must be entered for this feature. Substations (stations 21 and 22) are programmed to call 04 "1"x will call this Master.

Extension 20; "GUARD 2" Master station (Administrative Master) set for Full Privacy. This Master is programmed for Partition 2. This station can only place and receive calls from other stations in Partition 2. The Admin Call "Day" address of this Master is "2". Two digits must be entered for this feature. This Master is programmed to have a second (night) ownership of 1 which will be added to its "Day" ownership if "Night" mode is selected. Note: Admin Night Mode must be turned "ON" in the "V" section of programming. Substations programmed to call 04 "2"x will call this Master. While in the Day Mode this Master will receive calls from stations 23, 24 and 25. When in the Night Mode this master will receive calls from stations 21, 22, 23, 24 and 25.

Extension 21; "CELL 40" Substation with no Cancel button. Programmed to place Admin calls to Administrative Master "Guard 1". The call type is specified as "ROUTINE", Non-Locking. This station is programmed for Partition 2. This station can only call and receive calls from other stations in Partition 2.

Extension 22; "CELL 41" Substation with no Cancel button. Programmed to place Admin calls to Administrative Master "Guard 1". The call type is specified as "URGENT", Non-Locking. This station is programmed for Partition 2. This station can only call and receive calls from other stations in Partition 2.

Extension 23; "CELL 42" Substation with no Cancel button. Programmed to place Admin calls to Administrative Master "Guard 2". The call type is specified as "ROUTINE", Non-Locking. This station is programmed for Partition 2.

Extension 24; "CELL 43" Substation with no Cancel button. Programmed to place Admin calls to Administrative Master "Guard 2". The call type is specified as "EMERGENCY", Non-Locking. This station is programmed for Partition 2.

Part 5. Maintenance & Troubleshooting

5.0 MAINTENANCE & TROUBLESHOOTING

5.1 Station Fault Isolation

Because all stations are individually wired to Line Card Modules, the malfunction of one station or it's connecting wire pair will affect only that station and not propagate to other stations in the exchange. Each station line pair is foldback current limited. If the line conductors become shorted or draw excessive current, the Line Card voltage source will open circuit and automatically restore when the fault is removed. Line cards may be disconnected without removing power. Failed, configured stations will cause a mismatch between Connected stations and Programmed stations in the "V" program mode Active Station Count screen. The Cat. 4353 alarm station will illuminate an LED.

5.2 Echo-MB Mother Board Diagnostic LEDs

Red LED Digital Switch Status:

Flashes continuously when Digital Switch is operating normally.

Green LED Modem Status:

Steady indication when two modems are connected and communicating.

5.3 Troubleshooting

Symptom: System inoperative

Check power supply output for 24 Vdc.

Verify Digital Switch red LED flashing. If not, verify Digital Switch dip switch setting.

STATION PROBLEMS

Symptom: Master Station. When digit # "1" is pressed, LCD does not display and station may connect to another station.

Possible reason: "Station Type" has been incorrectly programmed. Verify "Station Type" is programmed as Master.

Symptom: A conventional Master LCD does not update properly.

Possible reason: Incorrect programming. Verify "Admin Own" field is set to "0".

Symptom: Attempted Call does not connect.

Possible reason: Failed station or wiring.

Check station wiring for shorts to other stations

or earth grounds.

In "V" mode screen 1, verify "P" stations Programmed is equal to "C", stations connected.

In systems with two Digital Switches, In "V" program mode verify Digital Switch Count = "2".

Symptom: Call drops after connecting.

Possible reason: Extension of calling or called station has been duplicated on another station. (Possible only with 4690 PC programming)

5.4 Master Station Diagnostic Indicators

A Master Station can display the following diagnostic messages on its LCD display.

1. "FAILED": The extension called is disconnected or failed.
2. "INVALID": The extension called is not in the callers partition.
3. "BUSY 2": All links busy.
4. "NO SERVICE AVAILABLE": More than eight Administrative Masters connected to an "L" node. Admin Master only.
5. "CONFERENCE LIMIT": Exceeded 10 conference in progress.
6. "MEMBER LIMIT": Exceeded 5 members for one conference.
7. "CHANNEL LIMIT": Exceeded 32 links for conference.

5.5 Procedure for Uploading Echo-PCX Code Updates (required only for feature changes or upgrades from Manufacturer)

1. From Windows Desktop choose Start-->Shut Down-->Restart in MS-DOS Mode.
2. Locate the floppy disk that contains both the upload utility and the file to be uploaded.
3. When "C:\\" is displayed, insert the floppy disk into the floppy drive and type "A:\<enter>".
4. "A:\\" should now be displayed.

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5. At this prompt type in<update file name>.S19<enter>”.

The message

“ Software Upload utility”

“Searching for equipment..”

“Found connection uploading file”

“

“Complete”

should display.

The actual upload process takes approximately 2 minutes. During the upload process, the system operation is suspended and all Master stations will display “OFF LINE”. When the upload is complete, the red LED on the ECHO-MB Digital Switch will begin flashing and the system will resume operation.

6. When the upload is complete, the “A;\” prompt reappears. Type “exit” to restart Windows.

7. If the JERONUPL program cannot find a usable COM port or there is a misconnection, the following screen may appear:

“Software Upload utility”

“Searching for equipment”

“Can’t find connection”

If this message displays:

- a. Verify computer to connection.
- b. Verify system is under power.

8. If there is a serial data transmission error during the upload process, the “fuel gauge” on the PC display will stop. Approximately 30 seconds after the error occurs the Digital Switch will begin running Default code. Press any key of the computer keyboard to abort the program and retry the upload.

9. Note that the upload may be invoked from the hard drive providing that the upload utility and the file to be uploaded are in the same directory.